Report of the Director for the Session 1952–53

Lectures and Teaching

With establishment by the University of a new division of the Diploma in European Archaeology B, additional tutorial instruction has been arranged to cover the pre-Roman sections of the new syllabus. A new course of instruction and practical training in the Recording of Archaeological Finds conducted by Dr. Kenyon and Miss du Plat Taylor was instituted. It was well attended both by candidates for Diplomas and Technical students and will be repeated in 1953–54. Other regular courses have been maintained as last year.

Two courses of special public lectures were held at the Institute during the session of 1952–53. In the Spring Term, beginning on February 25th at 8.15 p.m., four lectures on "Rome Beyond the Frontiers" were given by Professor Sir Mortimer Wheeler to audiences ranging from 62 to 72 in number. In the Summer Term Professor F. E. Zeuner gave five lectures on Tuesdays at 8.15 p.m., beginning on May 12th on "Geochronology," which were attended by audiences ranging from 26 to 40. On March 18th Dr. Potratz of the Seminar für prähistorische Archäologie, University of Frankfurt a. M., gave a lecture on "Bridle-bits as Evidence for the Early Use of the Horse," which was attended by 44 auditors. On Friday, April 24th, at 5.30 p.m., Dr. P. Dikaios gave a lecture on "The Excavations at Enkomi; New Light on the Late Bronze Age in Cyprus" to an audience of 38. Finally the Special University Lectures in Archaeology for 1952–53 were delivered at the Institute by Professor Carl Blegen of Cincinnati University on March 10th, 12th and 16th, at 5.30 p.m. His subject was "The Helladic Antecedents of the Greeks" and from 62 to 92 persons heard the lectures, which were illustrated by coloured as well as black and white slides.

This Session the Museums Association again asked the Institute to arrange an intensive one week's course for those of their diploma students who were specializing in archaeology. This course was arranged from April 20th to 25th and attended by four students. In addition to lectures and demonstrations given by members of the Institute staff, Mr. Grimes, Director of the London Museum, was good enough to demonstrate the methods of recording, conservation and display used with such success at the museum. The Museums Association again wrote to thank the Institute for its help.

As in previous years, the Prehistoric Society held in the Institute its Easter Conference which was exceptionally well attended. The hospitality the Institute is thus able to offer to the most active and distinguished prehistorians in the British Isles is much appreciated by the Society's members and provides a refreshing stimulus to staff and students alike.

Students and Research

For the Diploma in European Archaeology, Section A, 21 students have been working at the Institute, and for Part B 3 students: of these 5 were awarded the University's Diploma in European Archaeology A, and 2 were awarded the Diploma in European Archaeology B. Two students are reading for the Diploma in the Archaeology of Western Asia and one for that in Indian Archaeology.

Thirteen are registered for Higher Degrees at the Institute. Mr. Fazal Ahmad Khan has been granted an extension of his study leave by the Government of Pakistan and awarded a grant to visit the Louvre in connection with his thesis on "An Archaeological Study of the Indus Valley Civilizations and their relationship to the culture of Iran," which should be ready by the Spring Term 1954. Mr. J. J. Butler has been awarded a postgraduate grant from the Wenner Gren Foundation and has been given leave of absence to work in Denmark and Scandinavia. Mrs. Bridget Allchin is preparing a thesis on "Microlithic and Neolithic Industries of Hyderabad in Relation to Comparable Industries of Southern Africa." Mr. Anthony Sutcliffe, with a grant from the Department of Scientific and Industrial Research, registered at the Institute under Professor Zeuner for a Ph.D., the subject of his thesis being "Cave Fauna and Cave Sediments."

In the present volume we publish a very useful contribution to the subdivision of the British Bronze Age by Mr. A. ApSimon, completed after he secured the Diploma in Prehistoric Archaeology in 1952, and a description of some very significant Neolithic pottery secured by Mr. Hazzledine Warren at Lion Pit, Clacton, prepared by Miss I. Smith who has been appointed Assistant in the Department of Western European Archaeology since she secured the same diploma in 1953.

Mr. Justus Akeredolu, a Nigerian student in the Technical Department, has constructed, under the guidance of Miss Gedye and the excavator, a very instructive scale model of the "Neolithic" chambered cairn of Quoyness, Sanday, Orkney: the model, so constructed as to take to pieces in order to display the several architectural features of this imposing monument, after exhibition at the Institute has been sold to the National Museum of Antiquities of Scotland.

In the Technical Department six students completed regular courses during 1952–53.

Exhibitions and Collections

The year 1953, marking the centenary of the birth of Sir Flinders Petrie, was recognized as offering a suitable occasion for the commemoration of his outstanding contributions to most branches of archaeology. As far as the University of London was concerned the initiative in organizing the celebrations was naturally taken by University College, where Petrie was the first holder of the Edwards Chair of Egyptology. But with the lease of St. John's Lodge the University acquired the bulk of the fruits of his ten years' work in Palestine. Accordingly the Management Committee decided, after consultation with University College authorities, that this aspect of the distinguished British archaeologist's contributions to our knowledge of man's past should be commemorated by a special exhibition based upon the collections housed at the Institute. So, with generous help from Lady Petrie and Miss O. Tufnell, Dr. Kenyon, Lecturer in Palestinian Archaeology, arranged in the Cyprus Gallery a wisely chosen but eminently representative selection of specimens, supplemented by plans and photographs, to illustrate at once Sir Flinders's work and the development of man's culture in this area. She also prepared a catalogue that can serve at the same time as a handy manual of Palestinian Archaeology down to the Second Exile, which has been issued as Occasional Paper No. 10. The exhibition was opened by Sir Thomas Kendrick, Director of the British Museum, on Monday, June 22nd, when Dr. Margaret Murray also spoke. The exhibition remained open till the middle of September.

Among important additions to the equipment and collections of the Institute may be mentioned 150 specimen trays and a storage cupboard presented by Dr. L. S. B. Leakey, and a collection of potsherds from Meare Lake Village presented by the Somerset Archaeological and Natural History Society and Mr. St. George Gray, which will constitute most valuable research material.

Staff

The Senate has accorded the title of Recognized Teacher to Mrs. Maxwell-Hyslop, Lecturer in the Western Asiatic Department.

In view of the large numbers of diploma students and undergraduates attending courses in the Prehistoric European Department (thirty-two first-year students were enrolled in 1952–53) the Management Committee at its June meeting decided to create the post of Assistant in the Department for two years. After the Diploma Examinations Miss Isobel Smith, a former student, was offered and accepted the post for the Session 1953–54.

Leave of absence during the Spring Term was granted to the Lecturer in Palestinian Archaeology to continue her operations at Jerusalem. Miss Talbot, Assistant Librarian, assisted her for part of the session. Dr. Kenyon's results in 1953 were even more spectacular and scientifically significant than in 1952.

Publications

In addition to the Occasional Papers, the tenth of which has just been mentioned, the Annual Report itself since its first issue in 1937 has been made the medium for the publication of contributions to knowledge made by the Institute's students and staff or in lectures delivered at the Institute. The papers thus published have been highly appreciated and widely quoted by the foremost workers in all fields of archaeological research, and the Annual Reports have earned a high reputation among learned societies in this country and abroad. As a result the Institute's Librarian has been able to arrange exchanges with eighty-eight (seventy foreign, eighteen British) archaeological publications to which the Institute would otherwise have to subscribe. The saving thus effected both to the Institute's Library in subscriptions and to Great Britain in foreign exchange must be offset against the rising cost of the publication that is inevitable if the Annual Report is to appeal to the varied interests of the Societies whose publications we need for our Library. In fact by exchange we can and do obtain essential publications that it is virtually impossible to buy, notably from the U.S.S.R.

Accommodation

The acquisition by the University of houses or sites on the north side of Gordon Square and the University's allotment of most of these to the Institute, have considerably relieved the anxieties that have haunted the Management Committee and the Staff for the last five years. We have now a prospect of an adequate home—if not perhaps so commodious as St. John's Lodge—in the immediate vicinity of the Senate House, University College, Birkbeck College and the School of Oriental and African Studies. Staff and students alike ardently desire closer physical proximity to the other members of the University of London, for that should mean more frequent and intimate contact with our colleagues and fuller intergration with the work of the University as a whole. Still, though the Court has selected architects, the effective time before the deadline set by the Ministry of Works for the evacuation of St. John's Lodge is so short that fears of the interruption of our work have not been altogether banished.

Library Report

THE Library was well used throughout the session; fifteen students worked there regularly and there was an increase in the number of books borrowed.

Due to lectures by students, the loan of lantern slides was again doubled.

With the suspension of the lantern slide assistant's post, due to economies, help in keeping the Library open was given by members of the staff, Miss J. Phillips and Miss I. Smith, and one student, J. Butler.

During the summer vacation, Miss G. Chapman was employed for six weeks to enable the Librarian to take annual leave.

Volumes added to the Library	235	Volumes bound	245
By purchase	130	Volumes lent	2,949
Presented	82	Highest month: October	364
Exchanged	23	Lowest month: August	73
Pamphlets added to the Library	259	Volumes borrowed from outside Libraries	81
By purchase	26	Volumes lent to outside Libraries	11
Presented	216	Lantern slides added to the Library	769
Exchanged	17	Lantern slides lent	5,040
Periodicals added to the Library	360		

The following have presented books, periodicals and lantern slides to the Library:

Dr. V. G. Alkim; American Museum of Natural History; Professor C. J. Becker; Mrs. E. T. Boardman; Professor R. J. Braidwood; British Academy; British Archaeological Association; British School at Athens; J. B. Calkin; Comision Indigenista, Caracas; Professor V. G. Childe; C.I.B.A. *Review*; A. R. Clapham; J. Desmond Clark; Professor Codrington; Dr. I. W. Cornwall; Mrs. Cotton; J. D. Cowen; J. M. Cruxent; M. Dothan; Walter Dupouy; Miss M. Eates; Essex and Colchester Museum; Per Fett; Dr. Henry Field; Professor H. Frankfort; Miss I. Gedye; P. R. Giot; Dr. H. Godwin; Goldsmiths' Librarian; H. St. G. Gray; Miss D. Greene; E. Gren; L. V. Grinsell; H. Hodges; M. S. F. Hood; Executors of the late E. H. Hunt; India, Dept. of Archaeology; Instituto de Alta Cultura, Lisbon; Institute of Historical Research; International Wood Secretariat; Mrs. James; Sir Thomas Kendrick; Mrs. H. F. Key; A. D. Lacaille; A. Liestøl; Group-Capt. G. E. Livock; F. Lofts; Professor Mallowan; Miss E. Marriage; Lt.-Col. G. W. Meates; Mexican Embassy; Michigan University; B. Middleton; P. J. R. Modderman; Dr. H. L. Movius; M. Maitland Muller; Musée Royal du Congo Belge, Tervuren; National Museum of Scotland; C. D. P. Nicholson; A. do Paço; High Commissioner for Pakistan; P. Pfeffer; E. Pyddoke; A. Raistrick; Miss K. M. Richardson; J. Ritson; Dr. H. D. Sankalia; Science Museum; Miss Seton Williams; Dr. Stekelis; Miss G. Stretton; Sudan Antiquities Service; Suffolk County Library; Professor T. Sulimirski; A. Sutcliffe; Miss du Plat Taylor; A. C. Thomas; Miss O. Tufnell; Victoria and Albert Museum; Warburg Institute; The Wellcome Trustees; Mrs. A. M. H. Westland; Sir Mortimer Wheeler; E. S. Wood.

J. DU PLAT TAYLOR,
Librarian.

Report of the Technical Department

THE various courses given by the Department were attended this year by forty-six students.

Two students stayed on for a second year for more specialized study before returning to their museums. Mr. Saleh concentrated on casting, relief maps and student teaching, and Mr. Akeredolu studied model-making and during the year completed a scale-model of a chambered cairn at Quoyness for the Director and a model section of the ramparts at Stanwick for Professor Wheeler.

Last year's experimental museum visits proved so useful and instructive that they were repeated this year and will now form a regular part of the curriculum.

It was again possible to arrange visits to the Natural History Museum's workshops by kind permission of Mr. Edwards, and to the Research Laboratory of the British Museum where we were most kindly received by Dr. Plenderleith and his staff. Mr. Grimes was again kind enough to demonstrate the methods of recording and storage used at the London Museum and special problems of exhibition.

A new departure was two visits to the Courtauld Institute, where Mr. Reece Jones gave a talk on the ills to which paintings are subject from Egyptian times to the present day and how modern science can combat them.

A visit to the Geffrye Museum was also arranged, when Mrs. Harrison gave a talk on the activities of the museum relating to children both in school parties and as individuals.

The Department is also greatly indebted to Mr. Nicholson who gave two talks to the students, one on the treatment and reconstruction of the Lullingstone wall plaster and the other on mosaic pavements.

This year the Museums Association Diploma students asked to spend a larger proportion of the time available in the Department.

Miss Mottram, one of our full-time students, was appointed Technical Assistant to the Devizes Museum, where she is starting a laboratory.

Mrs. Rosenqvist who, amongst other things, is in charge of the preservation of Viking ship burials at Oslo, came to the Department for two months to study the treatment of wood, both here and in other British institutions.

The Department was able to borrow some material from the Petrie collection of the Egyptology Department at University College, so that students could have some practice in the treatment of leather and rush sandals, textiles, papyrus, etc. In return we were very pleased to help in the training of Mr. Burgess, who is to be the technical assistant in that Department.

We have also agreed to give a short two weeks' course to Mr. Coghlan, of Cambridge.

During the Easter vacation between twenty and thirty Fellows and Associates of the International Institute for the Conservation of Museum Objects were entertained to tea at the Institute. The Institute's films on conservation were shown and guests took advantage of the opportunity to inspect the various Departments, where members of the staff were available to demonstrate and answer questions. The success of this venture may be measured by the fact that Dr. Plenderleith later brought several members of his staff who had been unable to attend on that occasion to see the Technical Department for themselves. Many useful contacts were made in this way.

Among the interesting objects upon which work has been done by the department are ivory bulls and incised ivory strips from Nimrud and the Neolithic portrait skulls from Jericho; the latter are being treated by Miss C. Western.

IONE GEDYE.

Report of the Photographic Department

THIS is a year of achievement, for much has been accomplished with very little money. The financial allotment to this Department was very seriously reduced so that it was impossible to think of purchasing any new equipment, although a new film washing tank was badly needed and the purchase of such a tank had been contemplated before it was known that there would be no money for equipment. Such money that has been available has been spent entirely on materials, and only minor repairs that it was impossible to carry out in the Department, such as a new slide for the copying camera, necessitating skilled camera-makers' work, have been put out.

Although the cuts in the grant to the Department were severe, we have managed to maintain output and this has been done by (1) extreme care in working all solutions; (2) the use of the little stock left over from the previous year; (3) cutting down about 10 per cent of students' use of material; and (4) altering negative quality to suit types of paper and lantern slide material already in stock and so avoiding the purchase of other grades of material, and the co-ordination of drying and mounting work so that the dryer, glazer and mounter were all on at one specified time during the day, thereby cutting down the electricity charges.

The foregoing achievement would have been impossible without much co-operation and loyalty within the Department. The economies so effected have cost a lot in energy and in watching every little item of waste, so much

so that much of the sheer joy of working has been lost through this extreme concentration and jobbing to make ends meet. If the purpose *has* been served, then this Department is proud to have served in no mean measure—but it is felt another year of these measures would be bad not only for morale, but for the general tone of the output which must, in such an organization as the Institute, be of the highest standard.

Teaching

Classes have been large and interesting; tests were given during term, both practical and theoretical, and were more than satisfactory.

Students from the Diploma and Technical courses visited the Kodak factory at Harrow. Last year, Kodaks offered to arrange such visits twice a year and to include demonstrations of lens manufacture and chemical packing; it is hoped to take advantage of this offer because the factory is so large that it is impossible to see all that could be of use in one visit.

Production

1,882 lantern slides.
3,285 prints and enlargements.
138 hours at the projector for lectures.
Miniature projector used 42 times.
Cine projector used 29 times.

The Department has been presented with a cascade washer rack—constructed of oak, and a new sink rack of pitch pine, by Mr. H. R. Kavanagh.

M. B. Cookson.

Report of the Department of Environmental Archaeology

Teaching

The attendance at the First-Year Course in Environmental Archaeology was 16 and at the Second-Year Course, 18. The course on the Stone Ages of Africa and Asia was attended by 8 students. Within the framework of this course Dr. J. Waechter very kindly gave a series of lectures on North Africa, Palestine and Syria. The course on Advanced Palaeolithic Typology was attended by 8 students. One Ph.D. student began work on the formation of strata in caves, with the aid of a grant from the Department of Scientific

and Industrial Research. Since one of the conditions of this grant is that the student should be assigned some demonstator's duties in the Department, the raw materials collection is drawing considerable benefit from this temporary help. In addition there was one M.A. student and two research students under Statute 21 (iii). A special course was arranged for one other student.

Eight lectures were given by members of the staff outside the Institute, of which three were delivered in other colleges of London University and other Universities.

One excursion was made to the Box Hill district, twenty-five students attending.

Donations

The teaching collections of the Department were increased by donations from Mrs. O'Neil, Sir Edward Harrison (Ightham), and Messrs. A. G. Enock (Thame, Oxon), J. P. T. Burchell (Sevenoaks, Kent), S. R. Mitchell (Victoria, Australia), H. Hodges (Belfast) and C. Thomas (St. Ives, Cornwall), which are herewith gratefully acknowledged.

Research

The facilities of the Department were increased by the acquisition of a photo-electric EEL colorimeter and of a rock-cutting machine. The colorimeter permits the reading of very slight differences in colour intensity and has been used to develop rapid methods for the quantitative estimation of phosphates, organic matter and iron. Much time was devoted to the development of these methods, and the Department is now in the position of being able to investigate large numbers of samples within a short time. As regards phosphate determination the new colorimeter has already proved its worth in the location of the burial at Barnby Howes, Yorkshire. The cutting machine is used for the preparation of thin sections to be studied under the petrological microscope. Thin sections can now be made in the Department and, in difficult cases, submitted to experts for examination. A serious bottleneck will thus be avoided in future, since the expert is no longer expected to make the section himself. Whilst the machine will thus help in the identification of materials, it will mainly be used in the investigation of archaeological deposits and soils, using methods recently developed by Professor W. Kubiena of Madrid.

Research on Sites

Apart from sites studied specifically in the interests of research work in the Institute, fifteen requests to study soil and seven requests to identify materials and bones were complied with during the year. In all, 1,315 specimens

and samples were examined. Among the sites studied were the cinder cones of southern India, which proved to consist mainly of burnt cow dung, Barnby Howes barrows (Bronze Age: N. Mitchelson and P. Ashbee), a pit-filling from Stonehenge (S. Piggott), the Dorchester Big Rings (N. Thomas), Thornborough Rings, Ripon, Yorks (N. Thomas), and a number of Indian Stone Age sites from Gujarat, Baroda and Bombay Province. Other material came from Australia, Saudi Arabia, Kenya, Cyprus and the Channel Islands. An interesting collection of bones from Sutton Walls was studied for Dr. Kenyon.

Field Work

The Easter vacation was used, at the invitation of the Spanish Government, for a visit to Spain in order to inspect stratification and soil formation at prehistoric sites. Professor W. Kubiena joined the excursion, and particular attention was paid to the climatic interpretation of buried soils.

In the long vacation an excavation was made at the Palaeolithic site at Tornewton Cave, Devon. It lasted four weeks, and twenty students and helpers attended. This cave had been dug previously by a Mr. Widger in the last century and subsequently by the Torquay Natural History Society, but its stratigraphy had been neglected. The aim of the present excavation was to establish the stratigraphy and if possible to fit the earlier finds into the sequence of layers.

F. E. Zeuner.

The Socketed Celt in Upper Eurasia

By V. Gordon Childe

What an epoch-making invention the socketed bronze celt was, is not generally realized. It was, in fact, the first really economical wood-chopping tool, the first metal instrument cheap enough to be used for rough work like tree-felling even by poor peasants, remote from ore deposits and the great thoroughfares of the metal trade. As such it must have revolutionized the economy of the woodland zone of Eurasia and initiated that transformation of the landscape that the iron axe was a few centuries later to accelerate. Rightly has Brøndsted termed the socketed celt "the most democratic product of the Bronze Age."[1]

That metal is more efficient than stone for tree-felling and wood-working needs no demonstration. Obviously, too, the socketed celt, whether used as axe or adze, is superior to the flat celt or the palstav owing to its firmer union with the handle, and incidentally it is more economical in metal. It is not perhaps as satisfactory as the shaft-hole axe (such as modern iron axes), but it costs about half as much. By putting on the scales a Sicilian bronze shaft-hole axe and a British socketed celt with an equal width of blade, I found the latter weighed about half as much as the former and therefore required that much less costly bronze. To use such costly shaft-hole axes for rough work was beyond the means of all save economically well-organized and rich societies, like the urban civilizations of Hither Asia and prosperous Aegean towns and perhaps some more barbarian groups living close to ore lodes round the Caucasus or in the Carpathian basin. (Most shaft-hole axes from Hungary, Russia and Siberia have such narrow cutting edges that they would seem more suitable for weapons than for woodsman's tools.)

The socketed celt (by this term I mean an axe or adze with cast socket) was essentially produced for a woodland or forest market. Such celts are very rare on the grass-steppe zones of South Russia and Kazakhstan; I know none at all from India, Iran, Hither Asia, the Aegean or North Africa. But north of the Eurasian mountain spine (Pyrenees, Alps, Balkans, Caucasus, Kopet-dagh, Pamirs) throughout the parklands and forests beyond the steppes socketed celts were being made and used in huge numbers from Britain to China soon after 1000 B.C. Immense collections of such implements already in 1953 attest centres of production, most distinguished by recognizable local types, in Central (Saxony, Bohemia, Lusatia), Northern (Denmark, South Sweden,

[1] *Danmarks Oldtid*, ii, 58.

North Germany) and Eastern (circum-Uralian) Europe, on the Upper Yenesei in Siberia, on the Chinese-Mongolian border and in Honan[2] in China. On the Elbe and on the Middle Hoang-ho, where the evidence for dating is most reliable, the socketed celt seems to have come into use almost simultaneously—about 1300 B.C.

It is unlikely, both *a priori* and in view of the chain of intermediate centres, that the invention should have been made simultaneously, but independently, in Europe and the Far East. Moreover there is another yet more significant link between China and the West. About the same time as the socketed celt there appear on the Hoang-ho and the Elbe vehicles on *four-spoked wheels*, drawn by a pair of *horses* yoked on either side of a single *pole* ("paired draught"). Now wheeled vehicles[3] with paired draught were known in Mesopotamia and Elam

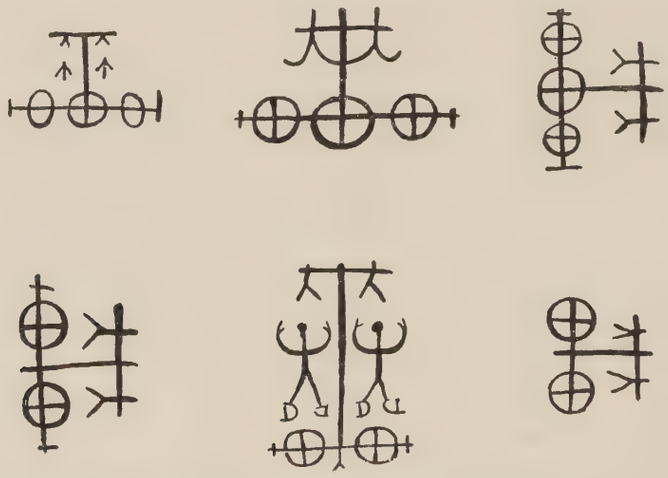

FIG. 1. Characters of the Chinese script of the Shang period representing chariots with paired draught, after Shih-chang-ju

about 3000 B.C. and horse-drawn chariots on spoked wheels appear in Hither Asia three or four centuries before they are attested in China by the oracle-bones (Fig. 1) and chariot burials of Anyang (Fig. 2).[4] I assume, therefore, that horse-drawn chariots and bronze equipment, including socketed celts, were among the instruments that enabled the Shangs to create a stable State on the Hoang-ho and that both were introduced from farther west. But not, of course, from South-West Asia. There the socketed celt was unknown; there roamed no wild horses to be tamed to replace the onagers, driven by the Sumerians; for horses are at home only in Upper Eurasia, north of the mountain spine. Nor is there any evidence for—nor yet against—the invention of the spoked wheel in Mesopotamia nor Anatolia. The Shangs' chariotry, like their socketed celts,

[2] For the metal work and chronology of Shang China I rely on Karlgren, "Weapons and Tools of the Yin Dynasty," *BMFEA.*, 17, 1945.

[3] Childe, *PPS.*, xvi, 1951, 177–87.

[4] The script signs are decisive, see Shih-chang-ju, "Recent discoveries at Yin-hsü," *Chinese Journal of Archaeology*, No. 2, 1947 (in Chinese, but Figs. on pp. 16 and 19).

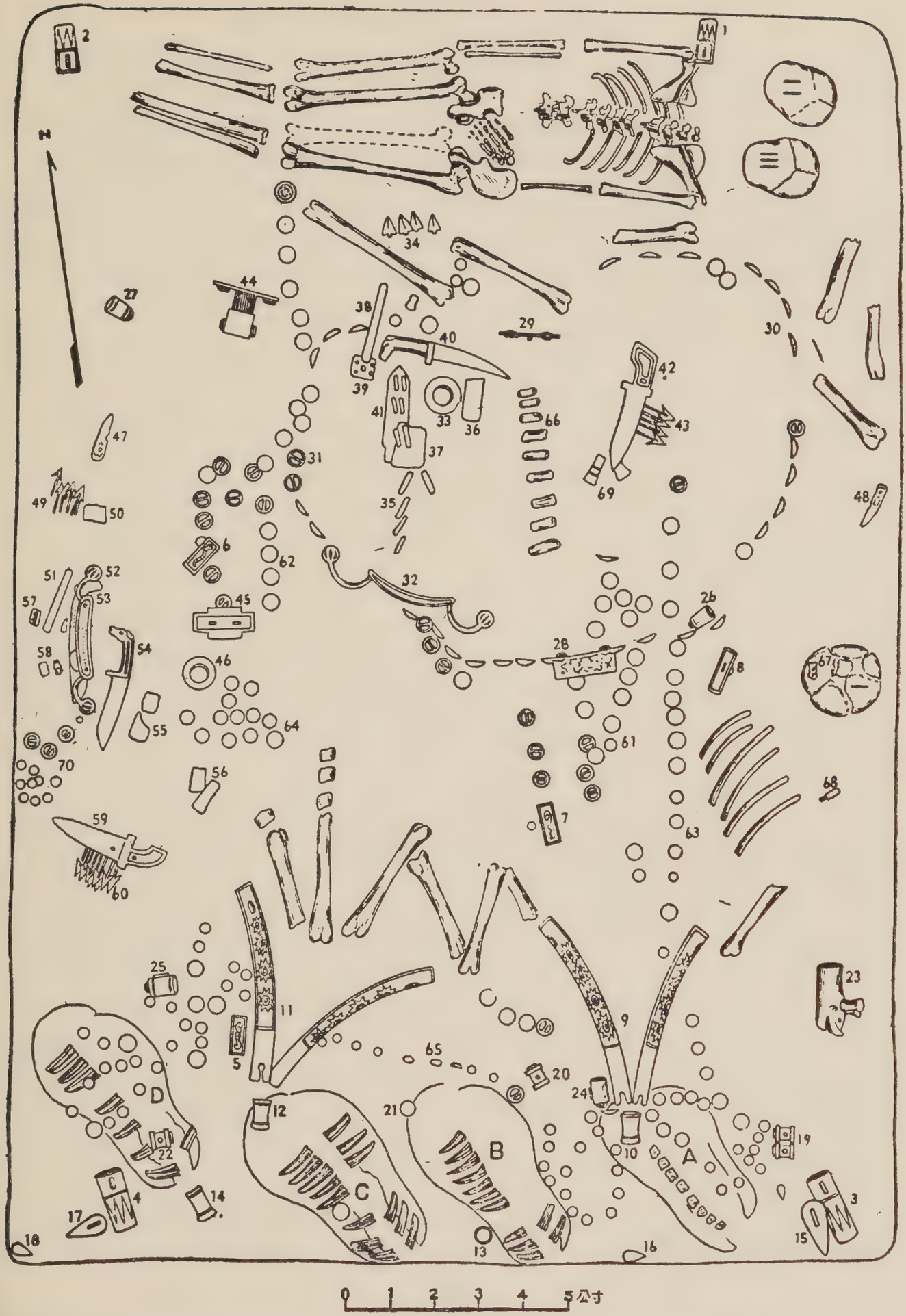

FIG. 2. Chariot grave at Anyang after Shih-chang-ju. Note the "model yokes" (32, 52) and animal handled knives (40, 54)

must be derived from some secondary centres of metallurgy and vehicle building farther north.

Since vehicles can be constructed of materials that do not often survive in the archaeological record, the starting point of the horse-drawn chariot must be harder to locate than that of the socketed celt if it, too, were diffused. Now evidently it could have been invented—or at least the invention socially approved—only where the normal chopping tool was either an adze or an axe, similarly mounted on a knee-shaft. This condition was fulfilled throughout the forest zone of Eurasia and in China; the vast majority of stone celts from the latter country, from the Siberian forests, from Central and North Russia, from the coniferous forests on either side of the Baltic and from the löss lands of Central Europe[5] are serviceable only as adzes.

In China and in the coniferous forests (taiga) of Northern Eurasia the bronze socketed celt seems to have succeeded the stone celt immediately without any previous translation of the latter into flat or flanged metal types. At least in the relatively large collections from China, from Sui-yuan and from the Minusinsk basin the latter types are unrepresented. China and Siberia can thus be eliminated.

On the other hand, it is notorious that Montelius and Sophus Muller have drawn up typological series that should illustrate the development by easy steps of the flat axe through winged, or wire-bound flanged, types to the socketed celt in Central and Northern Europe respectively. But Harrison[6] showed in 1926 that neither series was really complete; in each two decisive steps or mutations were undocumented. The first step would be the use of core-casting—the addition to the two-piece mould, required to produce a flanged or winged axe, of a movable core round which the metal could flow. But this should first yield two parallel tubes separated by the now functionless butt of the celt, forming a septum. A second step would be required to eliminate this septum after which, moreover, the end of the haft must be left unsplit.

In the same paper Harrison drew attention to another way of making a socket and to a series of implements from which a socketed celt might develop without involving the second of the above steps. Soon after 3000 B.C. the Sumerians and the people of Palestine[7] had produced socketed missile points from roughly triangular sheets of copper by simply folding and hammering the base round a mandril. In the second millennium a similar procedure was used to produce spear-heads with folded sockets in Iran,[8] Hither Asia, the

5 Childe, "Axe and adze, bow and sling," *JSGU.*, xl, 1950, 156–61; for Siberia see Okladnikov, "Neolit i Bronzovyĭ Vek Pribaikal'ya," *MIA.*, 18, 1950, *passim.*

6 *Man*, xxvi, 1926, 143.

7 Childe, *New Light on the Most Ancient East*, 1952, 160, 234.

8 Contenau and Ghirshman, *Fouilles de Giyan*, 1935, Pl. 31, T. 110 (couche—IV); Schaeffer, *Stratigraphie comparée*, 1948, 463.

Aegean,[9] Cis-Caucasia,[10] along the Volga[11] and round the Urals.[12] Now from Susa comes an adze, inscribed *E. kiši. din. ma* and dated soon after 2000 B.C.,[13] which is made from a stout trapezoid copper plate, edged along its narrower end while the corners of the opposite end have been bent inwards so as to overlap and form a tubular socket. Later in the second millennium similar implements with folded sockets are quite common in Hither Asia, Egypt and Greece.[14] They are usually termed hoe-blades, but some certainly served as adzes or chisels. One at least from Alişar[15] with a closed socket could have served as an axe, being symmetrical in longitudinal section. North of the Caucasus similar implements meet us in a rudimentary form in which the hammered up sides do not yet meet or overlap already in the Privolnoe hoard of Yessen's[16] stage III and with overlapped edges in the Kostromskaya hoard of stage IV. Farther north the same type occurs on both sides of the metalliferous and wooded Urals, for instance in the Verkhny Kizil hoard[12] in the Andronovo culture and in many examples collected round Kazan.

This sort of folded adze (or axe) can be converted into a socketed celt *sensu stricto* without the second step implied in the typologies of Montelius and Sophus Muller. Indeed, its form can easily be reproduced by casting in a two-piece mould with a movable core the lower end of which rests upon the inner face of the mould's upper valve. This yields a *transitional form* (Fig. 3, 3) of socketed celt in which the socket tube is open at both ends. For greater security, and still more to economize metal, the lower end would then be closed with a sheet of metal. To do this the clay core must be suspended so as to allow the moulten metal to flow all round it—an arrangement common to all socketed celts.

In North-Western Europe Maryon[17] believes that the clay core was kept centred simply by shoulders projecting from its head and engaging in grooves in the mouth of the matrix. But pins or ridges of metal may have been inserted in the core that were eventually absorbed by the molten metal, or a lump of fusible material like wax may have been used instead, leaving inside the casting raised spikes or ridges, corresponding to the holes or grooves in the core that had held the wax. On the other hand in Southern and Eastern Russia,

9 Childe, *Dawn*, 32.

10 Yessen, "K khronologiya bolščikh kubanskikh kurganov," *SA.*, xii, 1950, 157 ff. "Folded" spear-heads are assigned to stage IV.

11 E.g. Pokrovsk, 15, *ESA.*, i, 60.

12 From Verkhny Kizil on the upper Tobol (*ESA.*, iii, 122) to Seima on the Oka (*FM.*, 1915, 73); in Čuvašia folded spear-heads appear even in Fatyanovo graves at Balanovo, *KS.*, xvi, 1947, 32.

13 *Rev. Ass.*, xxvii, 1930, 187–8.

14 Petrie, *Tools and Weapons*, 18.

15 Von der Osten, "The Alishar Hüyük 1930–2," *OIP.*, xxix, Fig. 286.

16 *Op cit.*, *SA.*, xii.

17 *PRIA.*, cliv, 1938, C, No. 7.

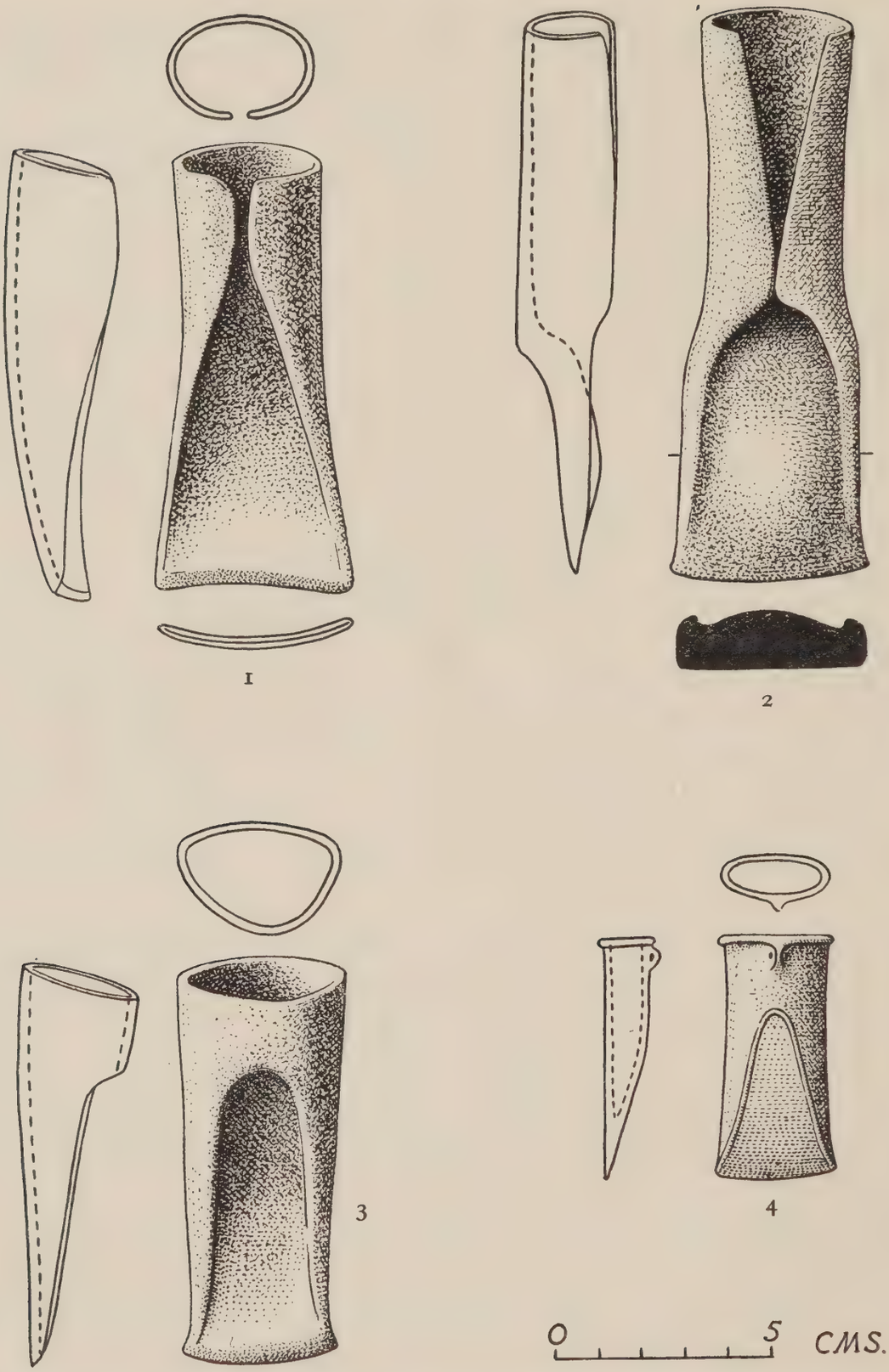

FIG. 3. Theoretical evolution of the socketed celt illustrated by specimens from Eastern Russia in the Zaoussilov collection at Helsinki. N.B.—The particular specimens figured are not in chronological order; No. 2 is actually of the Ananino epoch but elsewhere this stage does occur in the correct chronological horizon

Kazakhstan, Western Siberia and China,[18] clay pegs often projected from the inner face of the valve to support the core. The result was, of course, to leave holes in the faces of the celt, and such holes can be observed on many celts from the areas in question. Such a solution of the centring problem might well have been suggested by the "transitional form" in which the core actually rested against the face of the mould.

In any case the postulated transitional form is in *this* series actually represented, and all the logical steps in the evolution of the socketed celt can

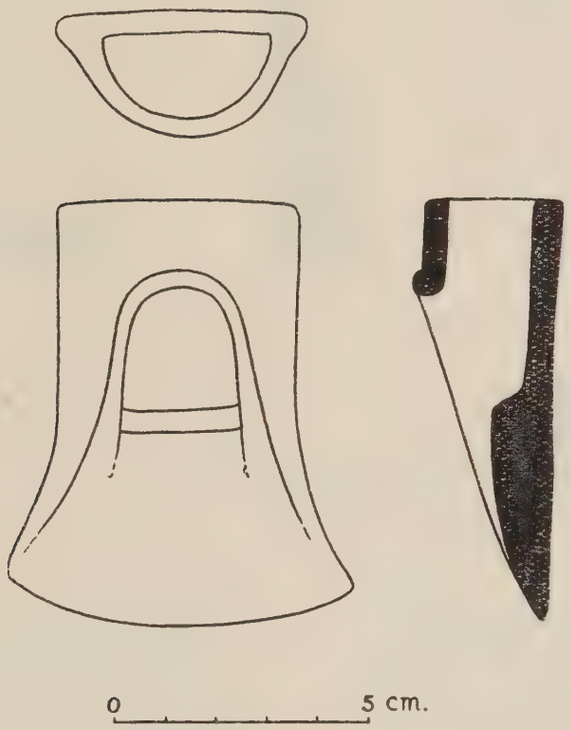

FIG. 4. Celt of transitional form from a Karasuk grave on the Biya. G. Istoričeskiĭ Muzeĭ, Moscow

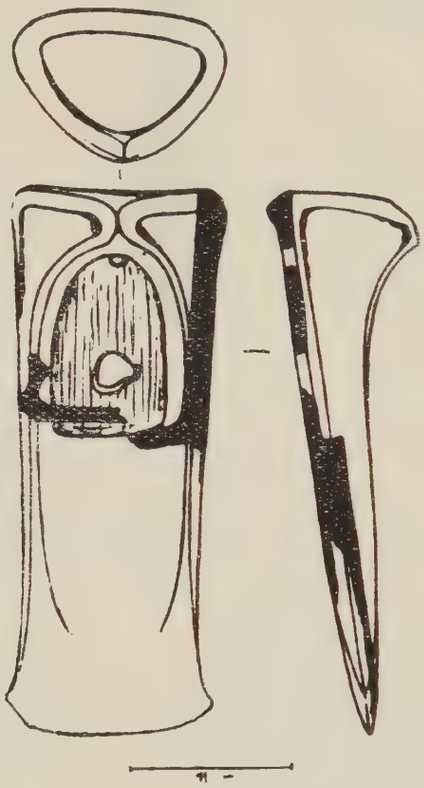

FIG. 5. Celt of transitional form from Ordos region

be illustrated by specimens collected between the Volga and the Urals by Zaoussilov (Fig. 3). The distribution of the transitional form is very significant (Plate I). I know a couple collected near Kazan,[19] west of the Urals, two from the Minusinsk basin on the upper Yenisei, three from the anterior Altai farther south (Fig. 4)[20] and one from Sui-yuan or "Ordos" on the Mongolian-Chinese border (Fig. 5).[21].

Assuming provisionally that the transitional type does really represent

[18] Watson in *BMQ.*, xvi, 1952, 105; cf. *KS.*, xvi, 1947, 65 ff.
[19] Tallgren, *Collection Zaoussilov*, Helsinki, 1916.
[20] Kiselev, *DIYuS.*, 118.
[21] *Archaeologia Orientalis*, ser. B, i, Tokyo, 1935, Pl. XXXVI, 14 and Fig. 7.

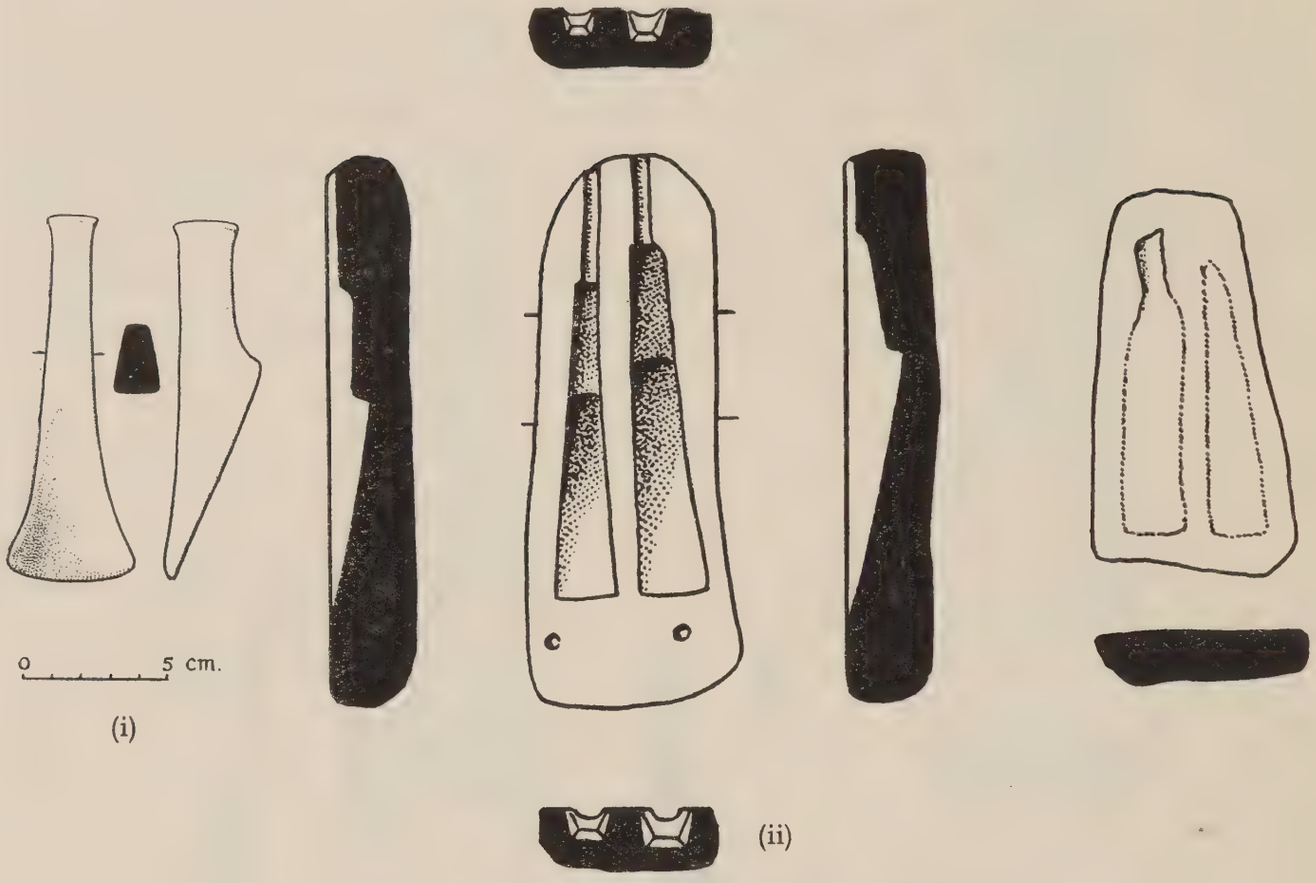

FIG. 6. Hump-backed gouge from Burman, E. Russia;
Mould for hump-backed gouge from Semirečia

FIG. 7. Andronovo pots from the Minusinsk basin after Kiselev

the essential step in the creation of the socketed celt, it need not be contended that this step was taken precisely where the evolution can be most fully documented in 1953. No doubt the Ural region was a peculiarly appropriate theatre for the invention. Round the Urals the temperate forest puts forth a finger projecting southward into the steppe zone towards the old Caucasian centres of metallurgy. The Urals themselves are rich in copper ores and yield even native copper while there are reports of tin near Čelyabinsk.[22] (A supply of tin bronze is probably a prerequisite for the postulated advance in core-casting.) But it may well be an accident that the assumed development can be most fully illustrated by museum specimens collected between the Urals and the Volga. These are the fruits of a century of collecting and excavation, while in the Central Asian S.S.R.s such research is only just beginning and may well produce just as rich and varied assemblages of metal types as are now available west of the Urals. Besides plentiful supplies of copper, tin ores undoubtedly exist in eastern Kazakhstan and the mountainous regions to the south-east.[23] The distinctive types of shaft-hole axe and dagger, familiar from the Lower and Middle Volga basins, recur near Tashkent[24] and in eastern Kazakhstan. Indeed the copper hump-backed gouge, one of the most peculiar types found on the Middle Volga (Fig. 6, i), was sometimes cast in the Ču valley in Northern Kirghizia (Fig. 6, ii).[25] In the Late Bronze Age the Andronovo culture[26] characterized by very distinctive pottery decorated with comb-stamped maeandroid patterns reigns with remarkable uniformity from the Tien-Shan and the Yenisei (Fig. 8) to the Urals (Fig. 7) and from the edge of the forests to the Aral Sea and the Kara Kum.

But is diffusion from a centre either on the slopes of the Urals or nearer the eastern borders of Kazakhstan chronologically possible? Assuming that the socketed celt was in fact among the instruments with which the Shangs created their Empire, it must have been invented before 1300 B.C. Indeed, since the transitional form is not reported from Anyang, it should have been superseded by the true socketed celt before P'an-keng founded his capital at Yin.

The only celt of transitional form found in a context comes from a grave

[22] *MIA.*, 21, 1951, 127; 30, 1952, 59.

[23] *SA.*, xv, 1951, 142; *KS.*, xxiii, 1948, 96; xxxvii, 149; Litvinskii, "K istorii dobyči olova v Uzbekistane," *Trudy Sredneaziatskogo Gos. Universiteta, Arkh. Sredneĭ Azii*, Tashkent, 1950.

[24] The shaft-hole axe from the Čimbailysk hoard on the R. Čirčik (*KS.*, xxxiii, 1950, 163) that I saw in Tashkent looked almost identical with one from a grave at Turbino near Molotov that I had seen a week before in the Hermitage.

[25] *SA.*, xi, 1949, 342 and *MIA.*, 14, 1950, Pl. XXXVIII; for specimens see Tallgren, *SMYA.*, xxv, 1911, 123 and *Col. Zaouss.*, 22.

[26] On this see especially Kiselev, *DIYuS.*; Tolstov, *Drevneĭ Khorezm*, 1948, 66–7; Formozov, "O proiskhoždenia A. kultury," *KS.*, xxxix, 1951, 1–16; Salnikov, in *MIA.*, 21, 1951, 100 ff. Grave-finds from the Kara Kum in Bokhara prov. are in Museum of Uzbek History at Tashkent.

FIG. 8. Andronovo pots from Federovki near Čelyubinsk in western Kazakhstan

on the Biya in Khakassia, assigned by Kiselev[27] to his Kara-suk stage (Fig. 5). The beginning of this stage coincided with a decisive event in the history of Eurasia—the first appearance of Mongols[28] on the steppes west of the Altai. (In the taiga zone Mongoloid[29] skulls have been reported from Neolithic graves not only in Siberia, but from several sites west of the Urals as far as Västerbjers

[27] *DIYuS.*, 118; on Kara-suk see also Jettmar in *BMFEA.*, 22, 1950.

[28] Debetz in *SE.*, i, 1947, 71 ff.; Kiselev, *VDI.*, i, 1948, 169 ff.

[29] E.g. Debetz, *KS.*, ix, 1941, 15; Trofimova, *SE.*, 1949, iii, 72; 1950, iii, 57; Briusov, *MIA.*, 20, 1951, 32; for Västerbjers I rely on a statement by Jettmar in his paper on Mongoloid skulls from Europe to the Internat. Anthropological Congress in Vienna in 1952. Whether the skulls cited really belong to Mongols *sensu stricto* or no, they are recognizably different from those found in the Afanesievo and Andronovo graves of the Central Asian steppes, in the South Russian steppe graves and even in the Fatyanovo graves of Central Russia. There Mongoloids reappear with the Ananino culture—*MIA.*, 30, 1952, 189.

PLATE I

Distribution of celts of transitional form, of Seima celts and of hump-backed gouges (△s)

1

2

3

4

5

Animal-headed knives from Anyang (1–2) Turbino and Seima. Wooden vessel in form of elk from Gorbunovo

on Gottland.) On the Upper Yenesei and Upper Ob the Kara-suk culture replaces the Middle Bronze Age Andronovo culture, as Mongols take the place of the latter's Europeoid bearers, and spread eventually at least to central Kazakhstan. (To ask how far this Mongol push westward affected the spread of the Androvono culture in Western Kazakhstan, the expansion of the Srubno culture from the Volga to the Dniepr[30] and perhaps even the thirteenth-century disturbances in the Near East and Central Europe, would take us beyond the scope of an article.) In Siberia the Kara-suk tribes introduced new techniques in metalwork and new types, many of which can be matched in Sui-yuan and at Anyang. Some, like the "model yokes" or "moon-shaped frontlets" (Fig. 9), if not imports, must be inspired by Chinese models (cf. Fig. 2).

But not all the parallels between Kara-suk and Yin need have arrived on the Minusinsk steppe with the first Mongol invaders, still less need all be inspired from the south-east. Single-bladed knives with animals' heads for handles, common to Minusinsk (Fig. 9, 62) Sui-yuan and Anyang, should be a "northern" element in China. The handles are surely inspired by that naturalistic art that had characterized the hunter-fishers of the circumpolar taiga since Mesolithic times. Its survival in the period in question is attested as far west as the central Urals by the superb wood-carvings from the Gorbunovo peat moss (Plate II, 5).[31] Its actual application to knife-handles is illustrated by bronze specimens from the cemeteries of Turbino near Molotov (Plate II, 3)[32] and Seima near Gorki[33] as well as by slate knives from the taiga zone even west of the Baltic. Indeed, the single-edged knife itself seems a northern type;[34] at least in South-West Asia and among the deciduous forests of Europe, as far as metal knives are concerned, double-edged types (knife-daggers) were preferred till the Late Bronze Age. Again the double-edged knives or daggers that are common to the Minusinsk basin, Ordos and Sui-yuan and are perhaps ancestral to the *akinakes* type, can themselves, as Jettmar suggests, be derived typologically from the knife-daggers of the Andronovo-Srubno phase that are in turn descended from the earlier type of the South Russian "Catacomb Graves." So animal-handled and double-edged knives probably spread to China from the North-West and so may socketed celts.[35]

[30] Cf. Artamonov, "K voprosu o proiskhoždeniĭ Skyfov," *VDI.*, 1950, ii, 46–7.

[31] Eding, "Reznaya Skul'ptura Urala," *TGIM.*, x, 1940.

[32] Cf. *ESA.*, xii, 1938, 121; the cemetery has never been fully published, but some grave groups are exhibited in the Hermitage.

[33] Tallgren, "Ett viktigt fornfynd från mellersta Ryssland," *FM.*, xxii, 1915; the cemetery may cover several generations and no closed grave groups have been published. One socketed celt may belong to our transitional form, but Tallgren's sketch and description are ambiguous.

[34] Cf. Gjessing, *Norges Steinalder*, 1945, 276. Somehow this must explain the remarkable resemblance of ring-handled knives from Anyang to those from the Late Bronze Age of North-central Europe; Kara-suk knives are less like either group, and I know none from the Ural region.

[35] Note also the occurrence about this time of rings of white nephrite, probably from the R. Irkut, both at Seima and at Anyang, Kiselev, *DIYuS.*, 145.

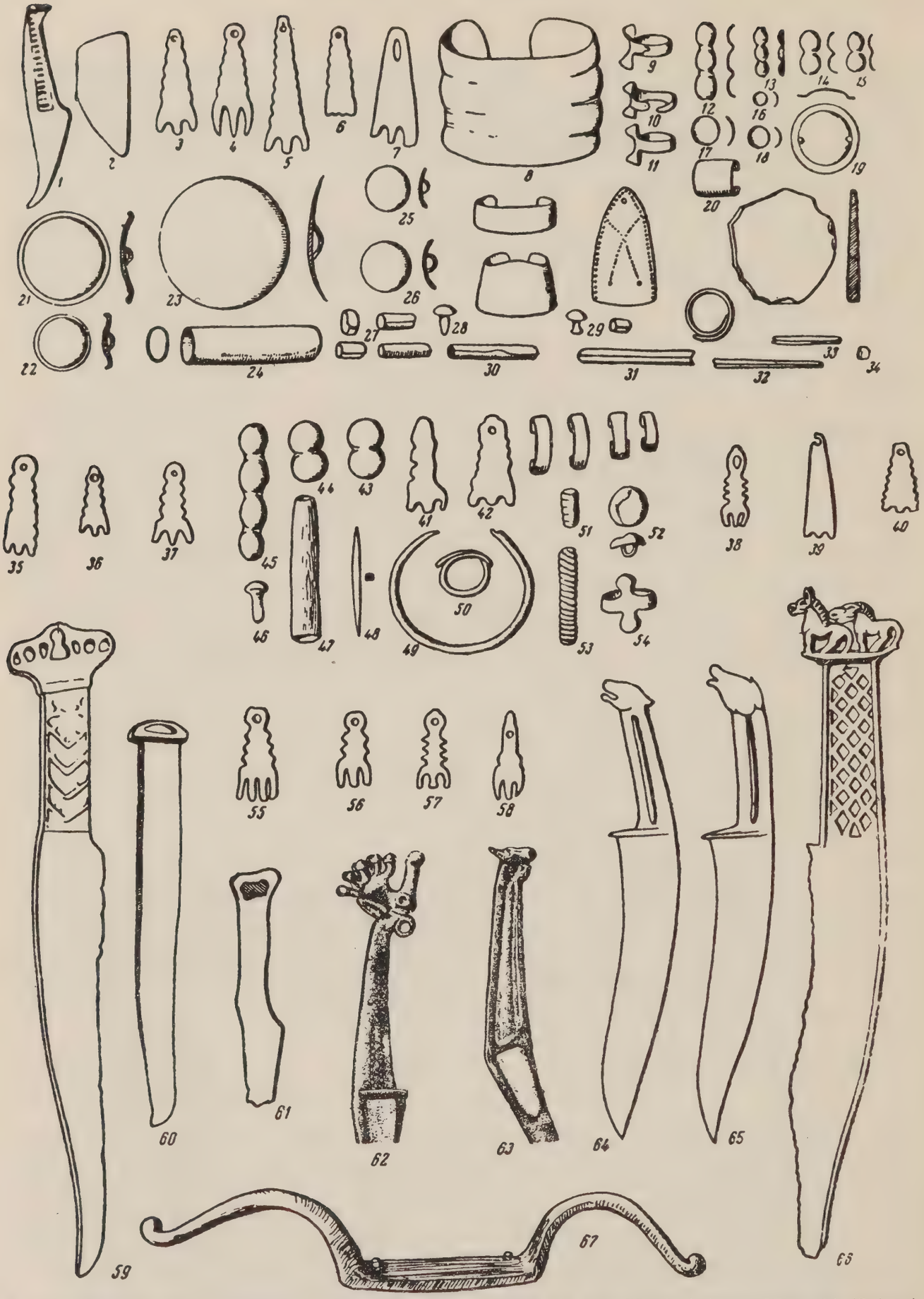

FIG. 9. Knives and ornaments of the Kara-suk phase on the Yenisei (save Nos. 66 (Seima), 64–65 (Anyang) and 59 (Irkutsk district) after Kiselev)

Hence though a partial synchronism between Siberian Kara-suk and Shang China is certain, 1300 B.C. is not necessarily a *terminus post quem* for the beginnings of the Kara-suk stage. Nor need a grave find from Southern Siberia give a limiting date for the creation of our transitional form.

In eastern Russia and western Kazakhstan the oldest socketed celts are reputedly the hexagonal axes of the type, named after the large cemetery of Seima on the Oka[33] and represented also in the graves of Turbino on the Kama[32] and by stray finds on both sides of the Urals. Kiselev assigns Seima celts to his Tagar phase that succeeds Kara-suk on the Yenesei, but Griyaznov,[36] rightly I think, assigns the Seima celts from Western Siberia and Kazakhstan to the Andronovo phase. A partial synchronism between the Seima and Turbino cemeteries and graves of the Andronovo culture round the Urals and of the Srubno-Khvalinsk stage on the Lower Volga is, in fact, quite certain. But in Siberia on the Yenesei, Andronovo precedes Kara-suk so that the completed Seima celt would seem older than our transitional type. The contradiction is only apparent. Krivtsova-Grakova[37] has shown in detail how, while on the Yenesei and Upper Ob "the normal development of the Andronovo culture was cut short by the intrusion of the Mongoloids bringing the Kara-suk culture, the former culture survived and continued to develop round the Urals"; there late Andronovo is contemporary with Kara-suk, and Seima celts are late Andronovo (cf. Table I).

It is not so easy to demonstrate the priority of our transitional form over the earliest socketed celts in Northern and Central Europe. The East Russian culture sequence can be linked up with Montelius' system of chronology for those regions best by the Inari hoard from Finland.[38] It contained a late version of the Seima celt together with Scandinavian ornaments proper to Montelius' V. Conversely in graves at Volosovo Ananino celts[39] are associated with Scandinavian ornaments of Montelius' VI. But in Denmark socketed celts were being used as weapons even in Montelius' II, and by Montelius' III local types appear in Lusatia too. It would require the shortest possible chronology for Northern Europe and the longest for East Russia to equate Andronovo with Montelius' II!

Core-casting again was being used to produce socketed spearheads by Montelius' I both in Northern, and in the Unětician province of Central Europe,

[36] "Drevnyaya bronza Minusinskikh stepeĭ," *Trudy Otdela Istoriĭ Pervobytnoĭ Kul'tury, Gos. Ermitaž*, i, 1941, 264; his arguments for deriving all Siberian celts from the Seima type are not convincing.

[37] *TGIM.*, xvii, 1948, 147–57.

[38] Tallgren, *ESA.*, xi, 1937, 26–45.

[39] Ananino celts are typologically descended from Seima, but by this time not only Mongoloids, but also Siberian bronzes (e.g. "picks") of Tagar type appear on the Kama, Zbru'ev, "Istoriya naseleniya Prikam'ya v Anan'inskuyu epokhu," *MIA.*, 30, 1952.

and in the latter region for the manufacture of socketed gouges[40] too. In North Syria,[41] too, the folded sockets of earlier spearheads had been translated into cast sockets soon after 2000 B.C. and the improvement was soon adopted in Greece and had reached Trialeti in Georgia[42] by the fifteenth century. This application of core-casting is illustrated in Cis-Caucasia in Yessen's phase V, on the Lower Volga[43] in Srubno graves, farther north in the Seima cemetery, and in Bessarabia by the Borodino hoard.[44] Whether the technique of core-casting illustrated by these spear-heads were invented in Bohemia or in North Syria, it must be earlier in both regions than its first attested application to make transitional celts on the Volga or on the Biya.

However, connections between the Central European Unětician province and the Middle Volga in the preceding period are suggested by cuff-armlets and lockrings from Fatyanovo graves in Čuvašia.[45] And very little later influences from Georgia and the Aegean may be traced. In her handsome republication of the Borodino hoard Krivtsova-Grakova has emphasized again its connections at once with Mycenaean Greece and with the Seima-Turbino industry of the Middle Volga and Kama. Knowledge of core-casting could thus have reached the Volga-Ural region from the Unětician province or the Mycenaean or, of course, from Transcaucasia.

In conclusion, it may be recalled that Harrison showed that the "wing-patterns" and similar ornaments on West and Central European celts are not survivals of the wings or stop-ridges on the types that they replaced, but skeuomorphs of the types with which they were competing. It would then be irrelevant to look for decorative survivals of our transitional form. What was diffused was the idea of the socketed celt. In each producing centre its first applications will imitate contemporary local types, and in Central and Eastern Eurasia these were of stone. The hexagonal Seima celt may thus imitate stone celts with a similar hexagonal cross-section such as come from Gorbunovo in the Central Urals.[46] In China Anderson[47] remarks how closely socketed adzes of bronze and even of iron reproduce the stone adzes of Yang-shao.

[40] *Arch. Austriaca*, No. 7, 1950, 2–8.
[41] Schaeffer, *Ugaritica*, ii (Paris, 1949), 55.
[42] Kuftin, *Trialeti* (Tbilisi, 1941), 64; cf. *Antiquity*, xvii, 1943, 184.
[43] E.g., in Pokrovsk 7, *ESA.*, i, 59, Fig. 19, 1.
[44] Krivtsova-Grakova, "Besarabskiĭ klad," *Izdania GIM.*, Moscow, 1949.
[45] *KS.*, xvi, 1947, 32–3, and Fig. 9.
[46] Noted in GIM. in Moscow, Sept. 1953; but of course the stone celts may copy the bronze ones.
[47] *Children of the Yellow Earth*, 1934, 211.

ABBREVIATIONS

BMFEA., Bulletin of the Museum of Far Eastern Antiquities, Stockholm.
BMQ., British Museum Quarterly.
GIM., Gos. Istoričeskiĭ Muzeĭ, Moscow.
DIYuS., Kiselev, *Drevnyaya Istoriya Yužnoi Sibiriĭ*, Moscow, 1951.
SE., Sovietskaya Etnografiya, Moscow.
VDI. Vestnik Drevneĭ Istorii, Moscow.
Others as in Childe, *Dawn of European Civilization* (*U Istikov Evropaiskiĭ Tsivilizatsiĭ*) and *New Light on the Most Ancient East.*

TABLE I

DATE	CHINA	ORDOS	YENISEI	KAZAKH-STAN	CIS-CAUCASIA	PONTIC STEPPES	URAL-VOLGA	NORTH CENTRAL EUROPE	DATE
					YESSEN PHASE MAIKOP I				
			AFANA-SIEVO		NOVO-SVOBOD– II NAYA	YAMY			
			ANDRONOVO		MIDDLE III	KATA-KOMBY	FATYA-NOVO	M I	
					KUBAN IV			M II AB	
1300	– –	– –	– – –	– –	– – –	– –	– –	– – –	1300
	SHANG		KARASUK			SRUBY		M II C	
							SEIMA	M III	
1000	– –	– –	TAGAR I			– –	– –	– – –	1000
					KOBAN V			M IV	
								M V	
700	CHOU	– –	– – –				– –	– – –	700
							ANAN-INO	M VI	
500	– –	– –	TAGAR II	– –	SKYTHIAN			– – –	500
	WAR-RING STATES							LA TÈNE	
200	– –	– –	– – –	– –	– – – – –		– –	– – –	200
	HAN		TAGAR III		SARMATIAN				

Neolithic Pottery from the Submerged Land-Surface of the Essex Coast

Part I. THE FIELD EVIDENCES

By S. Hazzledine Warren

1. General Remarks

The prehistoric remains found on the submerged surface of the Essex coast have been described in a number of papers (Warren, Piggott, Clark, Burkitt and Godwin, "Archaeology of the Submerged Land-Surface of the Essex Coast," *PPS.*, ii (1936), 178, where further references may be found), and it is sufficient here to recall that these mainly consist of flint implements, including polished axes, barbed and other types of arrowheads, flint sickles, polished oval knives, etc., together with Windmill Hill, Peterborough and B Beaker pottery. Nothing later than B Beaker has ever been found on the surface.

Most of the best flint implements occur as a general scatter over the submerged surface, and not on the camp sites, cooking-holes, etc., which have yielded the best pottery.

The richly ornamented vessel that is the main subject of the present communication was found with other sherds on the floor of a circular pit-dwelling of 15′ or 16′ diameter, which was exposed on the lower foreshore nearly two miles to the west of Clacton pier (G.R. 62/153129(5)).[1] It is recorded as from Lion Point, in accordance with the Ordnance Maps up to about 1930, but now called Jaywick, and the relics are registered as from Site 109.[2]

The position on the foreshore was below the outcrop of the submerged surface, which was seen at the time in a low cliff about 15 yards away, so one could not directly measure the depth to which the flat floor (which later was found to be the upper of two floors) had been sunk below the surface, but it must have been about 4′, if not more.

Tidal sites have their special difficulties for archaeological work, and the state of one's digging on the following day, after two tides have been over it, can be readily imagined; it is often best to dig about a foot deep the first time and then leave it until the sea has swept away all the debris. It

[1] An additional decimal point is added in brackets where this is needed.

[2] I have recently learned that the name "Lion Point" still remains in familiar use among some of the local inhabitants, though totally unknown to many. It does not appear on the new 2½″ O.S. sheets.

1. Decorated Neolithic Bowl from the Submerged Land-Surface of the Essex Coast.

2. Bronze Arrow-heads before (*left*) and after (*right*) treatment

proved here that below the floor as originally seen there was a sterile grey silt (an undisturbed natural flood silt) about 18″ thick. A similar grey silt occurs in many places in association with the submerged surface, but here it was confined to the area of the pit-dwelling which had been dug in Pleistocene brown loam. Below the grey silt there was a lower floor with sherds of Windmill Hill pottery.

Thus it is clear that there were two stages of occupation separated by flooding, but one must look to the pottery for evidence of their relative dating. From external evidence it might have been either that the same family returned to reoccupy their old home after the flooding subsided or that the site remained as a visible hut-circle for a longer or shorter time before being reused. One could hardly imagine that the site would be completely filled in and obscured, and then another independent dwelling dug in precisely the same place.

I have found only one other convincing example of a pit-dwelling with a flat floor on the submerged surface; this was seen in a similar situation to Site 109 on the foreshore at nearly $2\frac{1}{4}$ miles west of Clacton pier (G.R. 146(2)128). This is recorded as Site 102 (see *PPS.*, ii, p. 181, also Fig. 3, No. 4. Site 109 is also recorded in the 1936 paper, but the lower floor was not found until some months later). It was oval in form, measuring 20′ × 12′, and included the remains of a good deal of wood which presumably formed the roof. At this site (102) round-bottomed pottery was mingled on the floor with flat-bottomed domestic beaker. It may be that there was an overlap in the period of use of the two forms, particularly as the round-bottomed form is well adapted to out-of-door use, as it can be placed securely in a slight hollow in the ground, while the flat-bottomed form is better with a table.

However that may be, in my experience of the submerged surface it is much more usual for the closely associated groups of pottery to be either all round-bottomed or all flat-bottomed than for the two forms to be found together.

I have seen one or two other sites on the lower foreshore which were certainly pits that had been dug from the prehistoric surface, but there was not much left of them, and I would not suggest that they had been dwellings, which I think is a fair interpretation of Sites 102 and 109.

The cooking-holes, or earth ovens, are entirely different in character and far more common. Certain of the open sites are clearly an accumulation of waste outside a dwelling, but I have never seen anything that one could describe as a kitchen-midden on the submerged surface.

The following is the order of relative abundance of the various classes of pottery:

1. Windmill Hill ware—round-bottomed vessels without ornament are the commonest.

2. Domestic Beaker, with "rustication" (finger-nail ornament).
3. Grooved (Rinyo-Clacton) ware. This is confined to one site at Lion Point.
4. B Beaker—a good deal with typical ornament has been found at all Essex coast sites.
5. Peterborough ware—this is very much rarer than B Beaker.
6. Very rare variations, most of which, like the "A2," may be related to Peterborough ware.

There are also a large number of sherds of flat-bottomed ware carrying no ornament.

2. Site 109

On the lower floor were found pottery (see report below) and ten animal bones, most of which had been broken, perhaps to get the marrow. There were no flint artifacts.

On the upper floor lay pottery (see report on p. 30) and eighty-five pieces of flint. Most of the latter were waste flakes, but there were two small flakes with serrated edges and in the sandy residue from the washing of the relics were found three minute edge-trimming flakes. This shows that flaking was practised on the floor, but it is evident that the occupiers did not allow any great bulk of waste of any kind to accumulate inside their dwelling. Nearly 10 per cent of the flakes were burnt, and about a dozen broken-up pot-boilers were found. No bone was encountered on this floor.

Part II. THE POTTERY

By I. F. Smith

1. The Pottery from the Lower Floor

Examination in the Institute's laboratory of sherds from the lower floor has brought to light rim fragments of at least fourteen undecorated pots, and body sherds of perhaps ten more.

The majority of the rims are slightly thickened or rolled, but the more developed rims (Fig. 2, 2 and 3, Fig. 1, 1) appear to be characteristic of an eastern group of Neolithic A1 pottery. Similar rims were found at Hayland House, Mildenhall, Suffolk, in the same sandhill as a decorated A2 bowl,[3] and also at Peacock's Farm, Cambs.[4] They are, of course, typical in Yorkshire. It has been possible to make partial reconstructions only of Nos. 2 and 3, which represent Piggott's Form G, though with a rounded shoulder. The majority

[3] Leaf, *Proc. Camb. Ant. Soc.*, xxxv, 110, Fig. 3, 1 and 2.
[4] Clark, *Ant. J.*, xv, 301, Fig. 12.

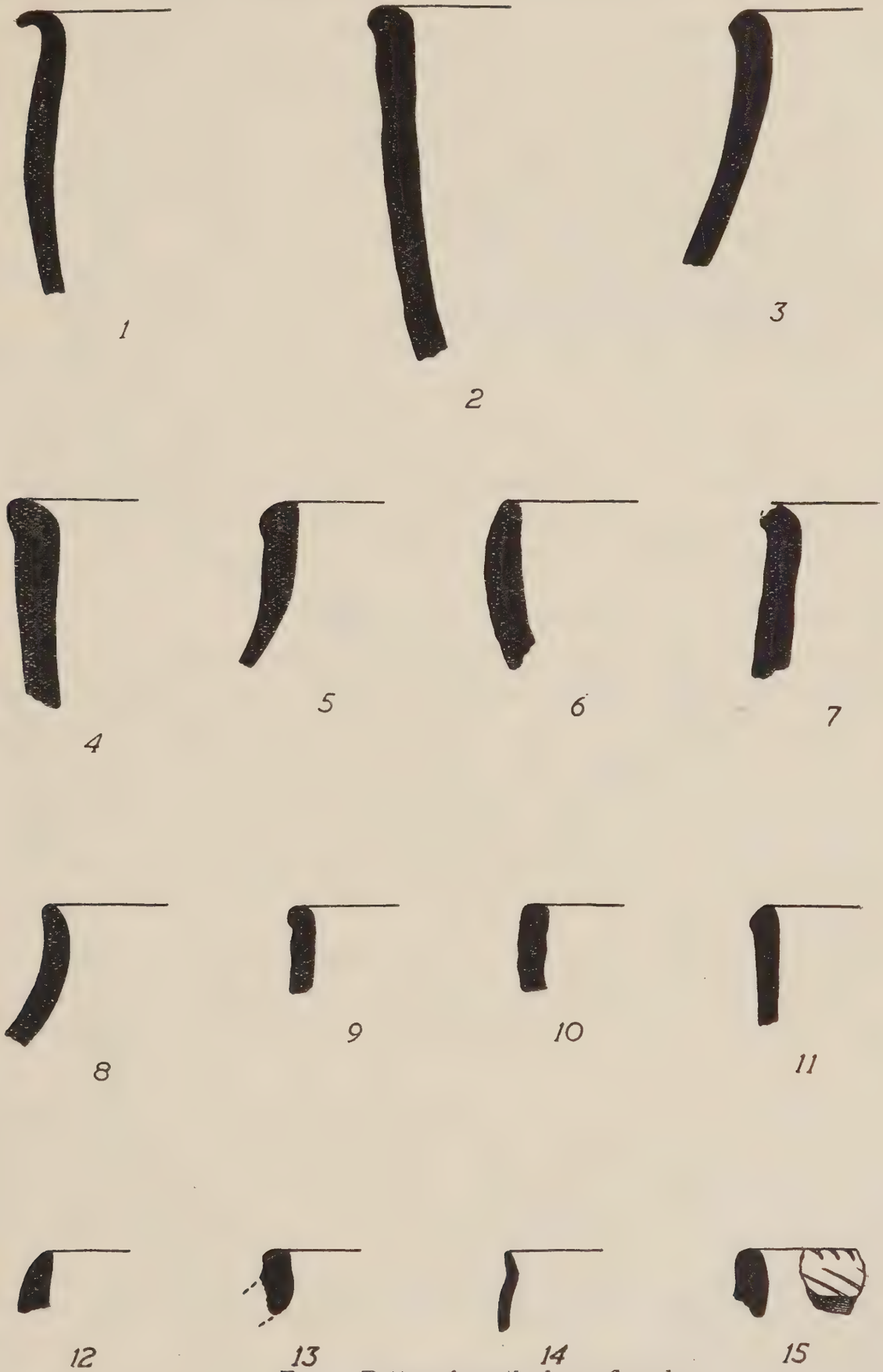

FIG. 1. Pottery from the lower floor ½

of rim fragments appear to have belonged to straight-sided vessels, but are nearly all so small that certainty is difficult.

A great variety of fabrics is present among the sherds from this floor, but they may be divided roughly into two classes:

1. Hard; clayey paste, which tends to laminate vertically; angular grits, with fragments up to $\frac{1}{4}''$ in length, sparse or abundant; fracture usually brown; thick brown slip often present, especially on the interior.

2. Softer; fine, homogeneous paste; small grits, well distributed; fracture usually black or very dark brown; thin slip occasionally preserved.

Crushed felspar and pink quartz, rarely small rounded quartz pebbles, were used for grit as well as burnt flint. Shell grit is visible in three small sherds of a soft, sandy, buff ware, all presumably belonging to the same vessel; the single rim fragment is illustrated (Fig. 1, 9). A rather similar shell- and chalk-gritted ware (Class C) comes from the Neolithic deposits at Maiden Castle, Dorset,[5] and shell-grit is reported from Windmill Hill,[6] Whitehawk[7] and predominates in the pottery from Abingdon.[8]

2. The Pottery from the Upper Floor

As reconstructed the pot from the upper floor (Pl. III, and Fig. 2, 1) is intermediate in shape between Piggott's Forms H and J. Its height is $7\frac{1}{4}''$, with external diameters of $10\frac{1}{2}''$ at rim and $11''$ at shoulder. Wall thickness varies from $\frac{3}{16}''$ immediately below the carination to $\frac{1}{4}''$ lower down. The paste is fine in texture and well fired; small fragments of burnt flint are distributed evenly and sparsely throughout. Both inside and out the colour varies from black at the top to a dull red at the bottom. Although the pot is well smoothed on both sides, most of the slip has been lost, and a few particles of grit protrude from the outer surface.

Examination of the shoulder fragments before restoration failed to reveal any indication that the neck and rim had been applied as a separate ring, although this device was commonly used in making pots of this and related forms.[9]

Five zones of decoration are distinguishable: two rows of short oblique slashes on the rim, running in alternate directions, one over the top, the other on the outside; the area from rim to shoulder is filled with close-set oblique strokes, somewhat broader than those on the rim; on some of the shoulder fragments a fourth row of oblique slashes runs in the opposite direction over

5 Report by Piggott on Neolithic pottery *in* Wheeler, *Maiden Castle, Dorset*, 140.
6 Keiller, *Proc. 1st Internat. Congress of Pre- and Protohistoric Sciences*, London, 1932, 136.
7 Report by Piggott on pottery *in* Curwen, *Ant. J.*, xiv, 114.
8 Leeds, *Ant. J.*, vii, 450.
9 Piggott, *Arch. J.*, lxxxviii, 74; Stevenson, *Man*, liii, May 1953, 65.

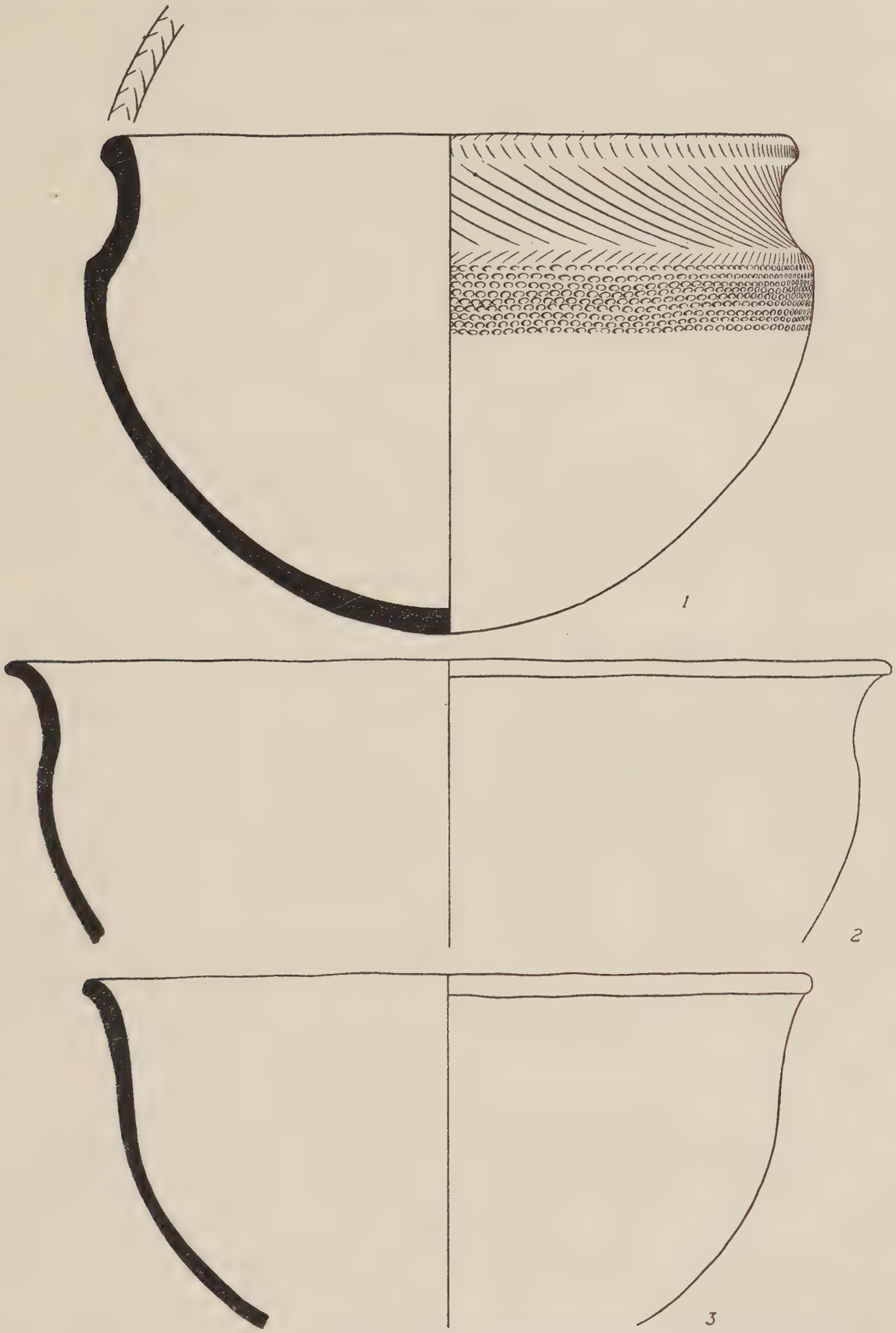

FIG. 2. (1) Pot from the upper floor; (2, 3) Pottery from the lower floor $\frac{1}{3}$

the carination itself; finally, eight or nine horizontal rows of triangular to oval impressions occupy a zone 1″ to 1⅛″ deep below the shoulder.

Slight irregularities seem to indicate that both strokes and dots were made with a single bone point and not with a comb, and the same implement may have been used throughout. The strokes are shallow, with a rounded bottom, in the style of Jacquetta Hawkes' "channelled ware," but the scheme of decoration suggests skeuomorphism rather than symbolism.

There is no sign on the surviving sherds that the pot ever had lugs or handles, though these are common on A2 ware. However, less than half of the shoulder is preserved.

The small rim sherd (Fig. 1, 15) belongs to a different vessel which may have been decorated in a similar fashion. Unfortunately it is not known from which floor it came.

Although vessels of Piggott's Form G from the causewayed camps at Whitehawk and The Trundle in Sussex are decorated in a somewhat similar manner, in details of form and ornament this bowl clearly belongs to an eastern group. The most westerly examples are two smaller bowls (one 5″, the other only 2½″ high) from Whiteleaf Barrow, Monks' Risborough, Bucks.[10] These bowls, both of Form H, lack ornament on the neck, but the smaller has on the rim two rows of oblique slashes running in opposite directions and three rows of larger slashes below the shoulder; the larger has criss-cross incisions on the rim and six rows of oblique oval impressions below the shoulder. This pot has also a most unusual feature on the body below the rows of dots. This appears to have consisted of an area about 1½″ deep and 3″ to 4″ wide, bounded at the top by a straight line and on each side by a curved line, the bottom being left open. On the surviving sherds the interior is filled with parallel incisions, the outermost of which run diagonally downwards from the top line. It is possible that on the missing sherds a similar series ran in the opposite direction, a few of the central pairs perhaps converging to form chevrons.

From Maiden Bower, Dunstable, Beds., comes an undecorated pot[11] which resembles in shape that from Site 109, Lion Point; on another sherd of related form are combined horizontal rows of dots and scorings on neck and rim.[12]

But a group of pots from Suffolk afford the most exact analogies. A bowl from the Kesteven Road site at Ipswich[13] is very nearly the duplicate in size and proportions of that from Site 109. The neck is decorated with shallow vertical channels and below the shoulder are four rows of round dots, very

[10] A brief note on the barrow appeared in *PPS.*, iii, 441, but the pottery has not been published.

[11] Piggott, *supra*, 91, Fig. 6, 1.

[12] *Ibid.*, 91, Fig. 6, 4.

[13] The pottery from this site, now in the Ipswich Museum, is unpublished, but a brief report of the excavation appeared in *Proc. Suffolk Inst. Arch.*, xxv, Pt. 2, 212–13.

carefully spaced. Finger-tip flutings run over the rim and to a depth of 2″ inside it. One sherd of what appears to have been a companion bowl comes from the same site. Fragments of vessels bearing similar decoration have been recovered from other sites in Suffolk: Dales Road Brickfield, Ipswich (J. Reid Moir Col.)[14]; Martlesham Plantation[15]; Hayland House, Mildenhall Fen;[16] and Hurst Fen, near Lakenheath.[17]

The peculiarities in form and decoration of the above-mentioned pots thus serve to define a south-eastern group within the Windmill Hill complex not hitherto recognized. It may further be noted that, with the exception of those from Whiteleaf, Maiden Bower and Kesteven Road, the bowls characterizing the group came from low-lying sites. The preference for such localities forms a further trait to distinguish the group.

[14] Pottery in the Ipswich Museum, not yet published.
[15] Pottery in the Ipswich Museum, not yet published.
[16] Leaf, *Proc. Camb. Ant. Soc.*, xxxv, Pl. I.
[17] Lady Briscoe has kindly provided descriptions of two bowls recovered during her excavations at Hurst Fen, to be published in *Proc. Camb. Ant. Soc.*

A New Method of Cleaning Corroded Bronzes

By Ian W. Cornwall and Ione Gedye

Preparations for the Petrie Centenary Exhibition (p. 3) led to the development of an unorthodox, but surprisingly effective, method of stripping the corrosion rapidly from reasonably well-preserved bronze objects.

Some socketed bronze arrowheads, mostly between 3 and 4 cms. in length, were required for an exhibit at short notice, and an attempt was made to strip the corrosion quickly by the use of mineral acids. The results were unsatisfactory, not only in that the bronze itself was liable to attack by the reagents, but because, in some places, the corrosion products still adhered, resisting even concentrated acids. These resistant areas would probably have yielded to the usual stripping agents (Fehling's solution, citric acid) in the course of time, but the occasion demanded speed, and a lapse of perhaps weeks, with intermittent inspection and mechanical cleaning, was out of the question.

It was thought that the resistant corrosion might to some extent consist of silicates, and it was evident that free silica, in the shape of sand-grains, was physically embodied in the corrosion layer. This suggested the application of the usual chemical method for the decomposition of silicates—fusion with sodium carbonate.

At first sight this treatment, as applied to a bronze, seemed somewhat heroic and not without danger to the object, but on reflection no very destructive side-reactions could be foreseen, provided that the temperature was not allowed to rise above the melting-point of the bronze, about 1,000° C. It was therefore decided to experiment with one of the less well-preserved arrowheads in a numerous collection.

The object was covered with anhydrous sodium carbonate in a nickel crucible of 3 cms. diameter and raised to the fusion-point of the reagent (about 850° C.) on a silica triangle over a bunsen burner assisted by a gas/air blowpipe with foot-bellows. A brisk effervescence ensued as soon as the reagent was fused, showing that reaction was taking place. Further sodium carbonate was added and fused until the object was completely immersed in the melt. Heating was continued, keeping the melt just fluid, until effervescence ceased, a matter of a few minutes only. The entire melt, with the object, was then quickly

poured out of the crucible into cold water in a porcelain basin and stood under a running tap until most of the solubles had leached out.

It was then found that the greater part of the corrosion products covering the bronze had already fallen away, and the remainder was in a cracked and sintered condition and could easily be removed with the minimum of mechanical assistance. The object then remained covered with only a thin layer of red cuprous oxide, which was removed by warming gently for a short time with dilute sulphuric acid.

The now clean arrowhead (Plate III, 2)—even the interior of the socket was readily cleaned with a needle—though not a very well-preserved specimen in the first place, was much superior in surface-finish to the acid-stripped examples. In view of this measure of success, it was decided to apply the treatment to a good specimen.

The result may be seen in Plate III, and may be judged to be extremely satisfactory. Even the finer details of the surface are preserved—the marks of the file or grindstone, used to clean up and sharpen the rough casting, and the burr formed in casting by the imperfect fit of the sutures of the three-piece mould, seen buttressing the angles of the triangular-sectioned point.

Discussion

The practical advantages of the method are manifest:

(1) Speed—the fusion operation as described takes no more than half an hour, the acid-stripping perhaps two hours more.

(2) Preservation of detail—mechanical cleaning with needles, wire brushes, etc., is reduced to the minimum, so that any detail preserved in the metal surface is revealed almost without a scratch.

A disadvantage is that heat-treatment destroys the evidence both of the manner and progress of the corrosion and the microscopic detail of crystalline metal structure which may reveal the processes by which the object was manufactured: casting, forging, cold hammering, annealing, etc. Neither of these considerations would constitute an objection to the present process, in the case, for example, of a coin, when it was desired to reveal the inscription rapidly on the site.

When clean to all appearances, the object may (indeed, probably does) still contain chloride, which, if left, may cause recurrence of the corrosion. After the sodium carbonate fusion, this, together with the other acid radicles (silicate, sulphate, phosphate, etc.) will be in the form of the sodium salt, i.e. water-soluble. The object should thus be soaked in changes of distilled water, periodically tested for chloride, and, when the test is negative, the object may be regarded as stable enough for permanent exhibition.

The treatment has also been tried on small iron objects, but the process is, in this case, much slower and the results are in no way superior to those obtained by the usual chemical and electrolytic methods carried out in the cold.

Hitherto the cleaning only of small objects has been attempted. Practical limits to the size of object are set by the size of the crucible necessary to immerse it completely in the melt and the means available of reaching and maintaining the relatively high temperature required. In the field, it would probably suffice to use a nickel crucible not more than 1″ (2·5 cms.) diameter and heat it by means of one or more plumbers' paraffin blowlamps—or even a "Primus" stove. In the laboratory a Méker blast burner with a fireclay hood to conserve the heat of the crucible would probably afford the neatest and most economical arrangement.

Dagger Graves in the "Wessex" Bronze Age

By A. M. ApSimon

THE original purpose of this essay was to draw attention to the presence in graves of the "Wessex" Bronze Age of two principal types of bronze dagger. A further attempt was made to shed some light on the chronology of this period by an examination of the history and associations of these types. After composing a first draft I became acquainted with Professor C. F. C. Hawkes' views on the British Bronze Age. I find that the results of the above examination agree well enough for me to present this essay as an amplification of part of his excellent scheme, though some differences in matters of detail may perhaps be allowed to me.

In this present instance I have restricted the use of the name '*dagger*' to weapons with a blade length of between five and thirteen inches. Smaller blades I have called *knives* or *knife-daggers*, following in this a distinction originally made by Dr. John Thurnam.[1] In this instance the distinction made by Colonel Gordon between daggers and dirks on the basis of the total length from tip to pommel, is inconvenient (if only that the hilts are almost universally absent), but his measurements for defining rapiers, short and long swords are in fact followed.[2]

The Bush Barrow Group

Daggers of this, our first type, have a triangular blade which may be flat or have a well-defined midrib. This variation is exemplified by the two daggers from "Bush Barrow" (Normanton, Wiltshire),[3] which we may regard as our type group. These daggers are fixed to their hilts by six slender bronze rivets arranged in an almost straight line across a broad shallow heel. The hilt has a small semilunar notch in the midline (Fig. 1, 1). Occasionally a vestigial tang or languette is present, though this never carries a rivet. The straight edge of the blade is echoed by a band of incised lines running parallel to it. The dagger from Normanton 139 (Wiltshire) carries "pointillé" decoration on its midrib, while the wooden hilt of the smaller of the two daggers from Bush Barrow was decorated with numerous minute gold pins.

[1] Thurnam, J. "On Ancient British Barrows—ii Round Barrows," *Arch.*, xliii (ii), pp. 452–3 (also p. 463).

[2] Gordon, D. H. "Swords, Rapiers and Horse-Riders," *Antiquity*, XXVII, 1953, pp. 67-78.

[3] Grave groups and hoards printed thus are listed with references in the appendices.

Daggers of this kind have been found in at least ten graves in Southern England and four examples are known from Yorkshire. Thrice a second large dagger of the same type has been found in the same grave.

ASSOCIATIONS OF SIX-RIVETED "WESSEX" DAGGERS[4]

Number of reliably recorded graves	14	Bone pin	1
Inhumations	8	Gold "breast-plate"	2
Cremations	4	Gold dagger pommel	1
Two daggers in one grave	4	Amber ornaments	1
Bronze knife (knife-dagger)	6	Mace or sceptre	2
Flat or bevelled bronze axe	2	Pottery	1
Crutch-headed bronze pin	1	Perforated whetstones	2
Bronze awl	1	Plano-convex flint knife	1

Among these associations we may notice several that are specially relevant from the point of view of chronology. These include the bronze crutch pin from NORMANTON 139 (Wiltshire) and the bone quatrefoil pin from BROUGH (Yorkshire), the bevelled bronze axes from Bush Barrow and from RIDGEWAY Barrow 7 (Dorset), the amber pendants from CRESSINGHAM (Norfolk), the gold plates from Bush Barrow and lastly the exotic five-handled jar from WINTERBOURNE STOKE Barrow 16 (Wiltshire).

There is little stratigraphical information connected with these graves. The group from AMESBURY Barrow 85 (Wiltshire) was secondary to an Early Bronze Age A inhumation with a flat dagger. The Ridgeway Barrow 7 group was stratigraphically later than a burial with a three-riveted dagger of a typical (though not ogival) form. The form of this dagger and its method of riveting have been taken to suggest influence from Irish halberds;[5] though the presence of a rudimentary tang or "languette" indicates some relation to our "Bush Barrow" series. The dagger from TOWTHORPE BARROW 233 (Yorkshire) was earlier than a typical Yorkshire food vessel, while that from HUTTON BUSCELL (Yorkshire) was apparently later than another rather fragmentary food vessel.

We may add to this group a number of daggers which seem to be in various degrees influenced by, or derived from, the Bush Barrow type. Among the more noteworthy of these are the two daggers from AYLESFORD (Kent) (Fig. 2) found with a flat axe of Hiberno-Scottish type and that from TOPPED MOUNTAIN CAIRN (Co. Fermanagh), found with a fine example of a Type E Irish food vessel. The gold pommel mounting of this dagger allows us to equate with this group three Scottish daggers found with similar gold objects. Most important of these is that from COLLESSIE (Fife)—actually a flat Bronze Age "A" type dagger, which was contemporary with two C Beakers. A gold bracelet or ring, rather similar in technique to these pommel mounts, and to the gold

4 Details of individual grave groups are given in Appendix A.

5 Piggott, S. *Dorset Nat. Hist. and Arch. Soc.*, Vol. 58, 1936, p. 24.

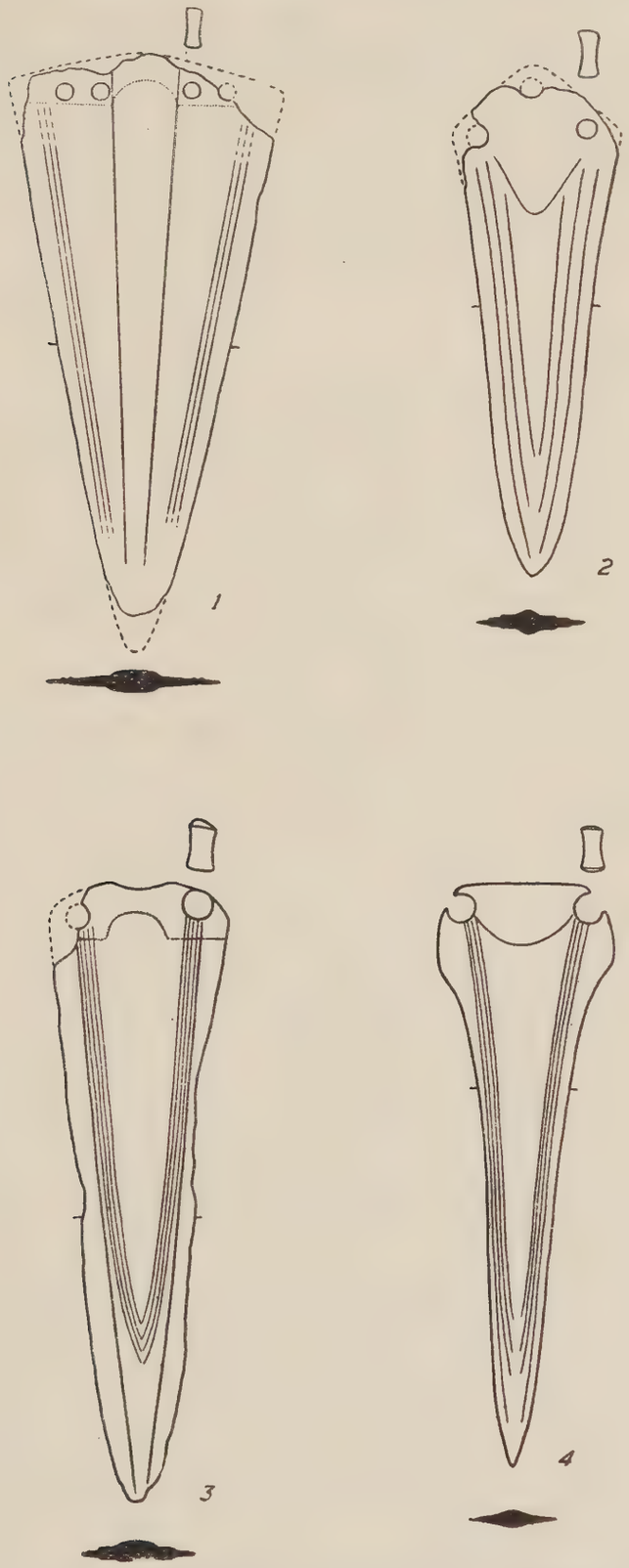

FIG. 1. (1) Bronze dagger from Brough, Yorkshire (B.M.). (2) Bronze dagger from Ashford, Kent (B.M.). (3) Ogival dagger from Beedon, Berkshire (B.M.). (4) Dagger from Gurvagh, Co. Derry (B.M.; W.G. 1602). By permission of the Trustees of the British Museum (Scale 1/3)

ring and (?) bracelet from CRESSINGHAM from Monikie (Forfar), was associated with a "food vessel" closely resembling some corded beakers.[6]

ASSOCIATIONS OF BRONZE DAGGERS INFLUENCED BY WESSEX "BUSH BARROW" TYPE DAGGERS*

Number of authenticated graves 8

Inhumations	5 or 6	Flat bronze axe	1
Cremations	2	Gold pommel binding	4
Two daggers in one grave	1	Irish food vessel	2

To these daggers from grave groups we may add one from an Irish hoard. This hoard, from KILLAHA (Co. Kerry), consisted of five flat axes, a halberd, and a two-riveted dagger with a languette and with two "blood grooves" incised on the blade. The axes, which have narrow butts and expanded cutting edges, belong like that from AYLESFORD to a Hiberno-Scottish type whose Irish representatives Raftery[7] has recently observed to be "found extensively in the Central Plain and Northwards of it."

The halberd is a large example of Ó Riórdáin's Type 6.[8] Its dating raises the question of the validity of his scheme of the origin and relative chronology of Irish halberd types. A serious objection to a very early beginning for halberd development in Ireland would seem to lie in the size and strength of these blades. It seems hardly credible that the rest of the British Isles, not demonstrably poorer than Ireland, would have been content to go on using ineffective and fragile flat Early Bronze Age knife-daggers had heavy midrib weapons been contemporarily available in Ireland.

The writer is inclined to regard halberds of types 1, 2 and 6 as relatively early and prefers to think that they were partly contemporary with Breton and Bush Barrow type daggers. Some of these, for example the midrib dagger from Bush Barrow, are very stout and heavy, while other signs of contact are not lacking. A particular example already cited is the three-riveted dagger from RIDGEWAY BARROW 7. Halberds such as Ó Ríordáin's No. 130 and Fig. 70, with sharply defined midribs and even numbers of rivets could very well be derived from these Breton and Wessex daggers. The halberd "idea" may no doubt be of continental origin. Raftery sought it in Central Europe, but the writer would prefer to look to an Italian origin for the Irish halberds both on typological and chronological grounds. The mass of Ó Ríordáin's types 3, 4 and 5 should be rather later and largely contemporaneous with the second type of dagger to be discussed below.

Another unlocalized Irish dagger (BM. 77. 1–16, 3) has a flat blade, a

[6] Anderson, J. *Scotland in Pagan Times: The Stone and Bronze Ages*, 1886, p. 66.

* Details of grave groups are given in Appendix B.

[7] Raftery, J. *Prehistoric Ireland*, 1951, p. 138.

[8] Ó Ríordáin, S. P. "The Halberd in Bronze Age Europe," *Arch.*, lxxxvi, 1936, p. 195.

round heel from which projects a small tang and four small rivets. It appears to be a hybrid between the Wessex Bush Barrow type and Early Bronze Age "A" knife-daggers like that found in a grave of the A beaker culture in Fovant barrow 9 (Wilts).

For the Bush Barrow type the best analogies are to be found in the bronze daggers from the Armorican dagger graves, which include daggers that are

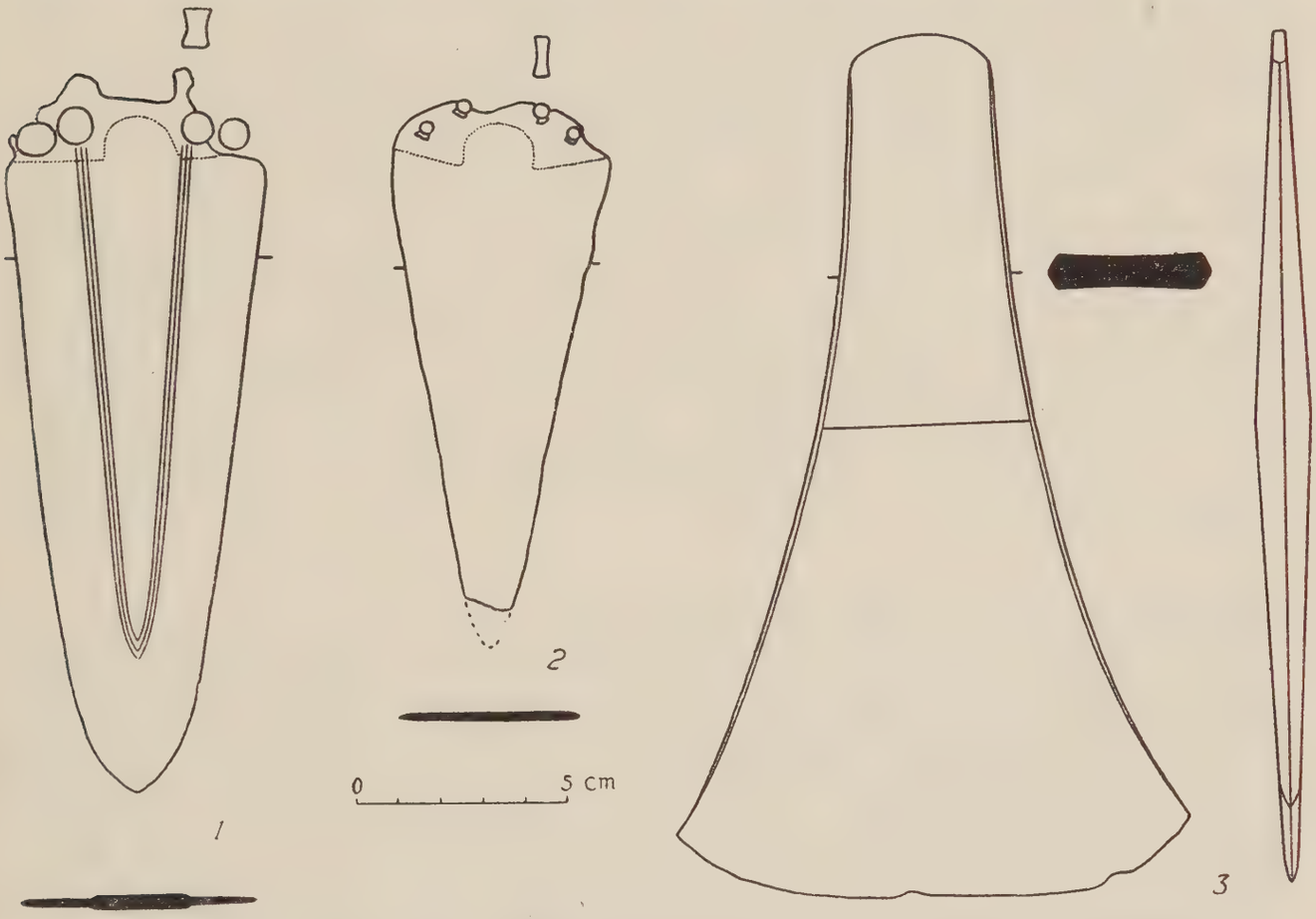

FIG. 2. Grave group from Aylesford, Kent. By permission of Maidstone Museum (Scale 2/5)

exactly like some English ones. Items of grave furniture such as sceptres and gold work also disclose real links. Burials with several daggers and axes, common in Brittany, occur only in a minority of English graves and with one exception (see Appendix B, 9) these all lie south of the Thames. The *pointillé* decoration of the NORMANTON 139 dagger seems to be absent from the Breton series; conversely the enlargement of the Breton daggers into a clumsy type of ceremonial sword does not seem to be represented in Britain unless by the weapon from CROGHAN ERIN (Co. Westmeath)[9].

Beyond Brittany related daggers can be found in graves of the Central

9 The "sword" from Kimberly (Norfolk) (*Arch.*, lviii, p. 3, Fig. 2), is an enlarged ogival weapon more akin to the class recently discussed by Fr. Holste (*Germania*, 26, 1942, pp. 4–12).

European Early Bronze Age; in particular we may note that from Donauberg Grave 3 (Alsace).[10] It has been made clear, however, that the origin of both the Breton and the Wessex "Bush Barrow" type daggers is to be found in the bronze-hilted daggers of Uenze's "*Saale-Oder-Elbe*" type.[11] The daggers from the Rhenish hoard of Gaubickelheim,[12] have been singled out in this respect, as they include examples with *pointillé*-decorated blades. A dagger of Italian type in this same hoard suggests that the sharply defined midribs of the British and Breton daggers are to be derived rather from the bronze-hilted daggers of the Italian Terremare, than from the Saale-Oder-Elbe daggers.

It seems clear that the continental relatives of our Bush Barrow type daggers belong to that part of the Early Bronze Age, which in Central Europe corresponds to Reinecke's AI. It is to this period, though probably to its latter part when measured against the classical Unětice culture of Bohemia, that the Gaubickelheim hoard is in fact assigned.[13] Similarly the Bush Barrow type of axe would appear to be related rather to the Breton and the Irish type I and II axes than to the low-flanged Saxon axes (cf. Neuenheiligen[14] and Dieskau[15]) which are classically assigned to Reinecke's AI.[16] Raftery has already remarked on the early Central European affinities of the Aylesford-Killaha type of axe.[17]

The Camerton-Snowshill Group—Ogival Daggers

The second distinct type to be discussed is that usually called the ogival dagger. Daggers of this type may be almost triangular in shape, but normally display a curved outline either in the cast edge of the blade, or in the incised lines or cast grooves found on the face of the blade. These daggers are provided with a stout midrib which is usually broader than that on the six-riveted daggers. The hilt is attached by three stout rivets which are much thicker than those of the first class of dagger discussed. Some of these daggers appear to have had only two rivets, though it is not always easy to tell whether or not a third was originally present (Fig. 1, 3).

Ogival daggers of the type defined above have been found in at least thirty-three graves as far apart as Cornwall and Yorkshire, though the main

[10] Schaeffer. *Les Tertres funéraires de Forêt d'Hagenau*, Vol. I, Fig. 31.

[11] Uenze, O. "Die frühbronzezeitlichen triangularen Vollgriffdolche" (*Vorgeschichtliche Forschungen, Heft* II), 1938.

[12] *Ibid.*, S. 82, Taf. 35.

[13] It may be noted that the Gaubickelheim daggers of Saale-Oder-Elbe type appear to be comparatively early of their kind. Böhm, W. *Die ältere Bronzezeit in der Mark Brandenburg* (V.F., 9), 1935.

[14] Childe, V. G. *The Danube in Prehistory*, 1929, p. 242, Fig. 143.

[15] Ó Ríordáin, S. P. *Loc. cit.*, p. 211, Fig. 13.

[16] Hecken, H. "Beitzsch and Knossos," *PPS.*, xviii, 1952, p. 44. These latter axes belong to a retarded A, later than Gaubickelheim.

[17] *Loc. cit.*

concentration of finds is in Wessex. No dagger of this type seems ever to have been recorded from a grave in North-West England, Wales, Ireland, or Scotland save for one possible exception, Appendix C, 43. Well-known and typical specimens include the daggers from WINTERBOURNE STOKE BARROW 15 (Wiltshire), from CAMERTON (Somerset), from SNOWSHILL (Gloucester), and from CHIPPENHAM BARROW 1 (Cambridge).

ASSOCIATIONS OF OGIVAL DAGGERS FOUND IN GRAVES[18]

Number of authenticated graves	33		
Burial rite: cremation	25		
Burial rite: inhumation	4 (? + 1)		
Six-riveted dagger	1	Whetstones	4
Bronze knife-dagger (? + 2)	7	Bone pin	7
Bronze spearhead (tanged- and-ferruled)	1	Bone tweezers	3
Bulb-headed bronze pin	1	Incense cups (? + 1)	5
Crutch-headed bronze pin	1	Aldbourne cups	1
Chain-headed bronze pin	1	Cinerary urn	1
Other bronze pins	2	Cornish urn	2
Bronze awl	1	Gold cup	1
Double-axe-hammers	4	Amber	2
		Faience	(? 1)

It may be noted that of the five burials by inhumation, four lie outside *"Wessex" proper* (CHIPPENHAM, HOVE (Sussex), RILLATON (Cornwall) and SNOWSHILL). The significance of the fifth is discussed later.

Besides the ogival daggers from graves we also have examples from the hoards of PLYMSTOCK (Devon), EBNAL (Shropshire), MOON'S HILL and ARRETON DOWN (Isle of Wight). These hoards and the related hoards of BUCKLAND (Dover, Kent), STOKE ABBOTT (Dorset) and WESTBURY-ON-TRYM (Gloucester) are too well known to require description here. We may, however, note that their contents include both tanged, and early socketed, spearheads, and cast flanged axes (sometimes decorated), as well as the daggers already noticed.

This would appear to be the place to mention two daggers that appear to be hybrids between the Bush Barrow type and the true three-riveted ogival dagger. These are the dagger from WOODYATES BARROW 20 (Dorset), found with a cremation in a cinerary urn and that from NORMANTON BARROW 164 (Wiltshire), which was associated with an inhumation accompanied by a knife-dagger and (allegedly) a "drinking cup." (It is exceedingly improbable that either this vessel or that from BULFORD (Wiltshire) was a beaker. Most probably they were either incense cups or small collared urns.) Both these daggers were cast with a slightly ogival outline, the former being equipped with three and

[18] Details of individual grave groups are given in Appendix C.

the latter with four of the slender type of rivet proper to our Bush Barrow type daggers.

For the purpose of discussing associations a number of dagger graves have been excluded from the preceding group. These include the dagger grave of CLANDON (Dorset) in which the dagger, though more probably of ogival type, was too fragmentary for exact determination. Graves with midrib daggers of degenerate or atypical form include that of HARLYN III (Cornwall) and that of ROKE DOWN (Dorset). This latter, found with a cremation and two knife-daggers, has been supposed to resemble more closely the Middle Bronze Age bronze-hilted rapiers and daggers recently discussed by Holste.[19] It may be noted that if these graves as well as others about which the available information is inadequate were added to the Camerton-Snowshill group to which they seem the more closely affiliated, they would only emphasize the numerical preponderance of cremations as well as confirming the associations with cinerary urns and incense cups.

We must now consider the affinities of the Camerton-Snowshill type of dagger. Most closely related to these would appear to be the Irish ogival daggers, which are very similar to the longer English ogival daggers in blade form,* though the heel is of different shape and the number of rivets is usually even (Fig. 1, 4). Unfortunately these daggers, stray examples of which occur in Scotland and Northern England, do not seem to have been found in association with other objects, that is if we exclude the mould from Broughshane.[20] However, a connecting link is provided by three *English* ogival daggers that are decorated in a style most nearly paralleled on the Irish daggers.[21]

Outside the British Isles this dagger form is quite widespread in its distribution, notable examples including a group from Middle Minoan Crete with well-developed ogival outlines, though still lacking midribs, which are, however, present on the ogival weapons of Late Helladic I-II.[22] The much earlier daggers from the Royal Tombs of Ur[23] tend towards an ogival shape though a strong midrib is already present.

Nearer to Britain, ogival bladed weapons are quite common in Western

[19] Holste, *Germania*, 26, 1942, pp. 4–12.

* The English ogival daggers tend to fall into two subtypes, a longer form typical of the hoards and a shorter form perhaps influenced by the triangular Bush Barrow daggers, that is more characteristic of Wessex graves. It is not, however, possible to draw a hard and fast line between these two variants.

[20] Evans, J. *Ancient Bronze Implements of Great Britain*, 1881, Fig. 519

[21] Childe, V. G. "A dagger from Hungry Bentley in Derbyshire," *Journ. Derby A. and N.H.A.S.* (N. ser.), Vol XV, p. 29. ApSimon, A. M. "A decorated bronze dagger of Arreton Down Type from the Thames near Bourne End," *Berks. Arch. J.* (forthcoming number). Newall, F. "Barrow 85, Amesbury," *W.A.M.*, xlv, p. 455.

[22] Evans, A. *Palace of Minos*, Vol. I, p. 195. Wace, A. J. B. "The Chambered Tombs of Mycenae," *Arch.*, lxxxii, Pl. VII. Karo, G. *Die Schachtgräber von Mykenae*, Pl. XCV (Shaft Grave V).

[23] Childe, V. G. *New Light on the Most Ancient East*, 1952, p. 159.

Europe. A three-riveted ogival dagger from Holland (Zuidlaren Barrow III, Prov. Drenthe)[24] suggests influence from British ogival daggers. Of certain Swiss ogival daggers, one in particular, from Broc Grave II (Kt. Freiburg)[25] which was associated with a "spatulate" flanged axe and three bronze pins, may profitably be compared with an unlocalized Irish dagger figured by Raftery.[26] This is not the only case which might be quoted of resemblance between the Swiss and Irish daggers. Significant in this respect are the Swiss ogival daggers with multiple *Rillen* or flutings, apparently derived from similar features on the blades of the local Early Bronze Age bronze-hilted "Neyruz" type daggers;[27] because an ogival dagger found stray at Ashford (Kent) (Fig. 1, 2) seems to be a copy of this type. Their contemporaneity with normal ogival daggers is confirmed by the two daggers from St. Martin (Kt. Freiburg)[28] found with a pin like those from Broc, and two palstaves best compared to the palstave-chisels from certain quite early German tumulus graves.[29] Finally, a dagger found in the Thames at Hammersmith[30] could well be a Swiss import.

The important thing about all these graves is that their pins and axes belong at the earliest to the end of the Early Bronze Age, Reinecke's A2/B1. Thus ogival daggers from Muschenheim (Oberhessen)[31] and Unterbimbach ("Igelsfeld" Hügel IV) (Kr. Fulda)[32] are assigned to Holste's "Ältere Hügelgräberbronzezeit." Daggers and short swords from Northern Europe also support this dating. The *westeuropäisch*-looking ogival daggers and dirks of Sögel type such as that from Bokelöh (Kr. Neustadt am Rubenberge)[33] are associated with *geknickten Randbeilen* (or nicked-flanged axes). On the evidence of the Regensburg hoard, which also contained a Bohemian palstave of quite mature type; and of other associated finds[34] the floruit of these axes is to be

[24] Van Giffen, A. E. *Die Bauart der Einzelgräber*, 1930, p. 32, Taf. 19; 3.

[25] Kraft, G. "Die Stellung der Schweiz innerhalb der bronzezeitlichen Kulturgruppen Mitteleuropas." *AfsA.*, xxix, 1929, Heft 1–3, Taf. V.

[26] Raftery. *Op cit.*, p. 141, Fig. 134.

[27] Kraft, G. *Op. cit.* (and also in *Festschrift für Otto Tschumi*, Taf. II, p. 59, Frauenfeld 1948; and Uenze, *op. cit.*

[28] Kraft, G. *Loc. cit.*

[29] Holste, *NMH.*, Taf. 14, 15 (Forst Neuenstein, Hügel I, Grab 7; Kr. Hersfeld). Taf. 2:8 (Unterbimbach, Kr. Fulda, Binz I).

[30] Peake, H. *The Bronze Age and the Celtic World*, 1922, Plate I.

[31] Kunkel, O. *Oberhessens Vorgeschichtliche Altertümer* (Marburg, 1926), p. 93.

[32] Holste, *NMH.* p. 158, Taf. 15.

[33] Sprockhoff, *BRGK.*, xxxi (2) 1942, Taf. 19:3.

[34] E.g. Regensburg hoard with spatulate flanged celts and Bohemian palstaves, *Germania*, 22, 1938, pp. 7–11; Börger (Drenthe), grave with Sögel dirk, tanged razor, etc., of M.I.B, *BRGK.*, xxxi (2), 1942, Taf. 20; Bokelöh (Hannover) with Sögel dirk in tumulus, M.I.B., *ibid.*, Taf. 19:3; Overloon (Holland) with Wohlde dirk of M.I.B. and II A (Holste, BI), socketed spearhead (cf. Virring) and pin of Holste's B—unpublished, information from J. J. Butler; Høghøj (Ribe), Broholm, *Danmarks Bronzealder*, i (1943), p. 27, Grav 47, with two type VI flint daggers; Fritzlar (Hesse) with primary (secondary with wheel-headed pin), Holste, *NMH.*, p. 148, Taf. 2:7.

dated to Reinecke's—and Holste's—"B1." These ogival weapons and their relatives occur in the same graves and hoards as do the earliest socketed spears. Finds from Denmark include the Virring hoard,[35] and the tumulus grave of Nordborg,[36] both assigned to Kersten's (Montelius') "IB."[37]

Judged by the "spatulate" flanged axes contained therein, the Trassem hoard (Kr. Saarburg)[38] with its bronze-hilted short sword, should be contemporary with that from Langquaid, Lower Bavaria,[39] with its early socketed spearhead and bracelet of early tumulus type; as well as with the bronze-hilted ogival dagger from Bex (Lausanne)[40] found with a flanged axe of "Tumulus type." The Cascina Ranza hoard (Milan)[41] which contains both socketed spearheads and bronze-hilted weapons belonging to the ogival series, belongs to the same horizon and has been equated by Holste with the "älteren süddeutschen Hügelgräberbronzezeit."[42]

Besides these axes, daggers, and spears, the Unětice parallels to the bulb-headed bronze pin from CAMERTON are assigned to the latter part of that culture, while the examples given below[43] suggest that the spread of this type of pin is to be dated to the Reinecke A2/B1 (= end of Montelius I) overlap.

The evidence set out above would appear to indicate that the continental relatives of our Bush Barrow type daggers belong in the main to an earlier phase of the European Bronze Age, than do the analogues of our ogival daggers. It would be natural to suppose that a similar relation might exist between these types in Britain, and we must now examine the evidence from Britain to determine whether in fact it does. For this we must first compare the contexts in which the two dagger types occur. In the case of the Bush Barrow group the relatively greater number of burials by inhumation as well as association or contemporaneity with food vessels, beakers and flat axes suggests that this group is earlier than the ogival dagger group, with its preponderance of

35 Forssander, J. E. *Die Ostskandinavische Norden während der ältesten Metallzeit Europas* (Stockholm, 1936), Taf. XL.

36 *Ibid.*, Taf. XLVII.

37 Kersten, K. *Zur älteren nordischen Bronzezeit*, 1938. (*Forschungen zur Vor- und Frühgeschichte aus dem Museum . . . in Keil*, Vol. 3.)

38 Behrens, G. *Die Bronzezeit Süddeutschlands* (Mainz, 1916), S. 19, No. 63.

39 *Ibid.*, S. 13, Abb. 4,

40 Uenze, O. *Op cit.* (*Also* Kraft *op cit.* Taf. III, 3).

41 Forssander, J. E. *Op cit.*, Abb. 34, S. 183.

42 Holste, Fr. *NMH.*, p. 30.

43 Bulb-headed pins—Vosov, hoard, with socketed spearhead, late flanged celt and precursor of Bohemian palstav, Richly, *Die Bronzezeit in Böhmen*, Taf. XLI; Langquaid (Lower Bavaria) hoard with socketed spear-head, flanged axe, Tumulus bracelet, Behrens, *op. cit.*, Abb. 4; Statzendorf (Lower Austria)—with smooth shaft—cremation grave with ogival dagger, *MAGW.*, lxvii, 1937, p. 277, Abb. 2, 1 and 3; Tinsdahl (Schleswig-Holstein) hoard with socketed spearhead, flanged axe, Kersten, *op. cit.*, Taf. II; Stecklin (Lower Saxony) hoard with flanged axe with rudimentary stop-ridge, palstaves, collar, etc., *BRGK.*, xxxi (2), p. 79, Abb. 63; Liebenau (Kassel), primary burial in barrow 6.

cremation burials, and associations with incense cups, bronze spearheads and cast-flanged axes.

In particular the ogival dagger from LOOSE HOWE (Yorkshire) was found with a cinerary urn, a pigmy cup, a stone battle-axe and a bronze pin that has been seen as a debased copy of a pin like the bone pin from BROUGH (Yorkshire). There is adequate evidence from Yorkshire that the association of a pigmy cup, a battle-axe and a cinerary urn of this type is a normal one. Wherever there is stratigraphical evidence Yorkshire cinerary urns and pigmy cups are found to be later than food vessels, a fine example of which type we have already seen to have been later than a dagger belonging, like the BROUGH dagger, to the Bush Barrow group. When taken in conjunction with the continental evidence set out above and with the known associations of the two groups, these facts are, in my opinion, sufficient to indicate that the life of the ogival dagger in Britain should extend to a later date than that of the Bush Barrow type.

At the same time, the two daggers from WINTERBOURNE CAME BARROW 10 (Dorset), one ogival, the other of rather degenerate Bush Barrow type, show that the lives of the two types must have overlapped to some extent. This conclusion finds support in the existence of the hybrid daggers mentioned above, as well as in the remarkable resemblance between the triple reeded midrib of a (?) three-riveted dagger from TEDDINGTON (Middlesex), and that of a dagger from the WESTER MAINS OF AUCHTERHOUSE (Angus), the disposition of whose rivets strongly recalls that on certain of the bronze-hilted *Saale-Oder-Elbe* daggers.

A dagger from the Scottish hoard of GAVEL MOSS (Renfrewshire) demands mention here. This dagger has a triangular shaped blade with three rivet holes whose dimensions suggest stout rivets akin to those on many halberds and ogival daggers. Mr. J. G. Scott, in his recent re-publication of this hoard, points out that the three central ridges which run down the blade suggest a fusion between a dagger type with a triple reeded midrib and a type with *distinct* strengthening ribs such as that from BLACKWATERFOOT (Arran). Daggers of both these latter Scottish variants have in fact been included among the relatives of our Bush Barrow type, but the two cast-flanged axes (of Megaw and Hardy's Type III) in the Gavel Moss hoard, show that this hoard belongs in time to the Arreton Down-Ebnal group of hoards. There is nothing surprising in this, for it is reasonably clear that the Bush Barrow period was a brief one.

To enlarge upon the possible early dating of the Bush Barrow group, we may note that it has been previously suggested that the Wessex goldwork was inspired by Mycenaean fashions. It is instructive in this respect to compare the Bush Barrow pieces with certain gold objects from the Fourth Shaft Grave at

Mycenae.[44] Similarly the British ribbed gold dagger pommels find a prototype in this same Shaft Grave.[45]

The graves containing axes similar to that from Bush Barrow might also be thought to be early. In support of this view we may cite the axe from West Overton (Wilts),[46] found with an inhumation and a crutch-headed pin, like that from NORMANTON 139. The group from Wilsford Barrow H. 18[47] with its peculiar bronze "standard," so remarkably paralleled by objects from pre-Hittite Anatolia[48] supports the case for direct contacts with (at least) the Aegean in this early phase of the Wessex period. The flat axe from Breach Farm (Glamorgan) found with a triple cremation and an incense cup of very exotic type probably belongs to our second phase.

We have already seen that of the inhumation graves containing ogival daggers, four were outside Wessex and the fifth also contained a degenerate Bush Barrow type dagger. We might well suppose that these daggers were early of their kind, a supposition which finds some support in the rather metallic looking "double-axe-hammers" from CHIPPENHAM, HOVE, and SNOWSHILL; the crutch pin from Snowshill, and the gold cup from RILLATON, whose similarities to the Mycenaean metal vessels have, if anything, been rather overstressed.

ABSOLUTE DATINGS

We have already seen that the resemblance between the flat gold work from Bush Barrow and that from Shaft Grave IV is sufficiently great for us to suggest that Bush Barrow should be contemporary with the Shaft Grave epoch. This gives an upper limit of about 1550 B.C. for the beginning of the Wessex period according to the scheme elaborated by Furumark.[49]

At the beginning of the Central European Middle Bronze Age—Reinecke B2—we find graves in Southern Germany and Alsace containing elaborately bored spacer beads for crescentic amber necklaces.[50] These beads have elsewhere been found in only one Mycenaean tomb (Kakovatos) and in one Wessex grave. Six other Wessex graves contained amber spacer beads; of these two lacked the complex borings of the Kakovatos example while those from the remaining four have not survived for examination.[51] However, examination of crescentic jet necklaces from the British Isles suggests that

[44] Karo, G. *Op cit.*, Nos. 236–9, Pls. XXXVI–XXXVIII.
[45] *Ibid.*, No. 285. Pl. XXXVIII.
[46] Colt-Hoare, R. *Ancient Wiltshire*, II, pp. 90–1 (*also WAM.*, vi, p. 329).
[47] *Ibid.*, p. 209.
[48] Kosay, H. Z. *Les Fouilles d'Alaca Höyük*, Ankara, 1951, Pls. CLI and CLII.
[49] Furumark. *The Chronology of Mycenean Pottery*, Stockholm, 1941.
[50] von Merhart, G. "Die Bernsteinscheibe von Kakovatos," *Germania*, 24 (1940), p. 99.
[51] Thurnam, J. *Op. cit.*, p. 504.

here we have the beginnings of the complex perforations of the amber space plates. As convincing prototypes for this type of necklace do not exist either in the Aegean or in Central Europe, it has been supposed that this type of necklace was first translated into amber in the British Isles and later exported to Europe.

The spacer beads from Tholos tomb A at Kakovatos in Elis were found with pottery which Furumark ascribed to his Mycenaean IIA and which he dated to between 1550 and 1450 B.C. Merhart assigns the pottery to the Late Helladic I-II transition and dates it similarly, while Stubbings[52] has recently suggested that it should be dated after 1450 and nearer to 1400. It therefore seems likely that the manufacture of these amber necklaces in Britain had begun before the middle of the fifteenth century B.C.—in terms of Professor Hawkes'[53] Units of Para-historic chronology—XV (ii).

To decide what this implies for Central European datings it now becomes necessary to attempt a brief analysis of the rich female graves from Wessex. Though we find trinkets in these graves, some of which are closely datable, we are nevertheless faced with the problem of making an allowance for the heirloom value of these trinkets. This must remain an unknown quantity but I am reluctant to allow much more than a generation between manufacture and deposition in a grave, with perhaps a maximum of two generations, especially where the object is exported.

From the table it will be seen that of the seven graves containing amber space-plates which might otherwise be supposed to belong to XV (ii), one (Amesbury G.44) also contained a gold-bound disc of amber. These gold-bound amber disc-pendants, having been found in three Wiltshire graves and in only one Cretan tomb, are generally regarded as a British product, though de Navarro[54] has argued with some force in favour of a Mediterranean origin. Evans[55] originally dated the Tomb of the Double Axes (Knossos), in which was found a single gold-bound amber disc, to Late Minoan II, dating between 1450 and 1375 B.C. Later Furumark assigned it to Late Minoan III, A1 (*c.* 1425–1400), while Lawrence and Stubbings[54] in their review of the pottery, suggest a date between 1420 and 1370 with 1390–1380 as the most likely period.

It seems reasonable to suppose that the three Wiltshire graves containing these pendants should be roughly contemporary as there is a fair degree of

[52] Verbal communication by Miss S. Benton at Institute of Archaeology lecture, London, March 1952.

[53] In Professor Hawkes' scheme each century is divided into three Units, each roughly corresponding to a generation; thus in the fifteenth century we have successively three Units—XV (i), XV (ii), XV (iii).

[54] Navarro, J. M. "The British Isles and the Northern Early Bronze Age" (in *The Early Cultures of North-West Europe*, pp. 102–5).

[55] *Arch.*, lxv, p. 33.

correspondence between their contents. Relying on the Cretan example and allowing for possible heirloom time-lag we might assign them to XV (iii).

This later dating, as compared with Upton Lovel and Wilsford G.54 finds some support in the large urn from Hengistbury, and in the incense cups from Hengistbury and Normanton 155, in which the original distinction between "stand" and "saucer" present in the Wilsford incense cup has been forgotten. Similarly, the grape cup from Manton is a poor degenerate thing as compared with those from Upton Lovel and Normanton 155. On the other hand the Manton inhumation, the gold cones from Normanton 155, the late A2 affinities of the gold ingot-torque pendant from the same grave and of the halberd pendants are a warning against pushing the dating of this group down too far.

From the English evidence it would appear that the life of these crescentic amber necklaces extended from XV (i) to XV (iii) or XIV (i). Thus quite independently of the German argument as to the German and Mycenean amber spacer beads being exported from England by different routes and therefore not necessarily contemporaneously, we find that we are not rigidly compelled by Kakovatos to start Reinecke B2 before 1450 B.C.

However, some of the Wessex graves containing amber necklaces must be older than this. Upton Lovel Gold Barrow and Wilsford G.54 are two such graves. In the case of the former the gold cone and flat gold plate, whose design and technique, different from that of the gold cones previously alluded to, suggest that they are the work of the same craftsman as the pieces from Bush Barrow, indicate an early date.

The Wilsford grave, with its inhumation burial accompanied by a small cord decorated vessel, two gold discs decorated with Mycenaean "Shaft Grave" derived ornament, and amber pendants best matched in a Bush Barrow phase grave (CRESSINGHAM), must be equally early. The pottery from both these graves indicates that they belong chronologically to our Camerton-Snowshill phase, though to its very beginning, certainly by XV (i); a dating demanded by the Shaft Grave affinities of the RILLATON cup.

It would thus appear that there are no rich female graves assignable (it obviously not being possible to date *poor* graves) to the Bush Barrow phase of the Wessex period. As the connection between the furniture of male and female graves is rather tenuous, it is comforting to observe that the same is true of Montelius IA in the North, of the early Armorican Bronze Age graves and of the earliest Tumulus Bronze Age in South-West Germany.[56]

The cast flanged axes from the Arreton Down group of hoards, which are among the types assigned to our second phase, will help to confirm the lower limit for the Bush Barrow phase. These axes appear to be close copies of a

[56] Broholm, *Danmarks Bronzealder*, ii, 1944, p. 34; Cogné and Giot, *L'Anthr.*, lv, 1951, pp. 425-44; Holste, *NMH.*, p. 116.

type of axe current in Central Europe during the Early Bronze Age,[57] but which had gone out of fashion by the beginning of the Middle Bronze Age—Reinecke B2. To judge from their absence from characteristic hoards they did not long outlive the beginning of the A2–B1 overlap. If we let "B2" (and closely with it, Montelius IIA) begin in XV (ii), then B1 should overlap A2 from at least the start of XV (i). This means that the English life of these axes and with it the Arreton Down–Snowshill–Camerton phase cannot begin any later than this same time.

It may be noted that two of the graves containing amber spacer beads (Amesbury G.44 and Wilsford G.54) also contained segmented faience beads. As these beads seem to have been fashionable over a long period of time in the Near East, and as the best dated parallels to the Wiltshire beads are supposed to belong to the fourteenth century B.C., it would seem that as yet these beads are of little value for precise dating and we must suppose that their importation from Egypt began in the preceding century, at the same time as the export of British made trinkets to the Mediterranean.[58]

The Mycenaean dagger from Pelynt (Cornwall)[59] and the dagger of East Mediterranean type from Winterbourne Bassett (Wiltshire)[60] have no precise dating value though they both suggest that trading contacts between Britain and the Mediterranean continued appreciably later than the fifteenth century.

To conclude, we may summarize the chronological results of this essay:

(i) The Bush Barrow phase (= Wessex I) should occupy the latter part of the sixteenth century B.C., in terms of Hawkes "Units" XVI (ii)-XVI (iii).

(ii) The Camerton–Snowshill phase (= Wessex II) should last through from XV (i) to XV (iii)–XIV (i).

This conclusion as to the relative duration of the two phases is supported by the relative numbers of English dagger graves assigned to the two phases. Thus for Wessex I we have sixteen graves, for Wessex II between thirty and forty.

[57] The axe with cast flanges and pointed butt from the Plymstock hoard in particular may be compared with examples from the following hoards and graves: Sobochleby (Bohemia), Childe, *Dawn*, 1950, Fig. 57; Unter-Themenau (Feldsberg, Lower Austria), Natur-historisches Museum, Vienna; Wolznach (Pfaffenhofen am *Inn*, Upper Bavaria), *Germania*, 30, 1952, p. 291, Taf. 14:1; Liebenau (Tettnang, Swabia) seven examples (Kraft, *Die Kultur der Bronzezeit in Süddeutschland*, Augsberg, 1926, p. 127; he lists nine others, eight from an area between L. Constance and the Danube within thirty miles of Liebenau); Vel'ký Grob near Senec (Slovakia) from grave of Wieselburg culture, *Arch. Rozhledy* (Praha), v, 1953, p. 147, obr. 68. See also Note 16.

[58] Beck, F. H., and Stone, J. F. S. *Arch.*, lxxxv, 1936, p. 234; Fox, A., and Stone, J. F. S.; *Ant. J.*, xxxi, p. 25.

[59] Childe, V. G. *PPS.*, xvii, 1951, p. 95.

[60] Cunnington, M. E. *Catalogue of . . . Devizes Museum*, Vol. II, p. 63.

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TABLE SHOWING THE PRINCIPAL CONTENTS OF THE RICHER FEMALE GRAVES OF THE WESSEX PERIOD

OBJECTS (and significant details)		GRAVES A	B	C	D	E	F	G
Funerary Rite	: Cremation	–	X	–	–	X	X	X
	: Inhumation	X	–	X	X	–	–	–
Pottery: Cinerary urn (small)	(a)	X	X	X	X	–	X	–
: Ditto (large)	(b)	–	X	–	–	–	–	X
: Grape cup		–	X	X	X	–	–	–
: Openwork incense cup		–	–	–	–	X	–	X
: Reversible incense cup		X	–	–	–	–	–	–
: Pointillé incense cup	(c)	–	–	–	X	–	–	–
Bronze: Flat riveted knife		–	X	–	X	–	X	–
: Awl (square tanged)		X	X	–	X	–	X	–
Gold: Plates or discs		D	P	–	–	D	–	–
: Cones		–	–	–	–	–	–	X
: Cones—plated on shale		–	X	–	–	X	X	–
: Beads, buttons, boxes		–	X	X	–	–	–	–
Gold bound amber discs		–	–	–	X	X	X	–
Halberd pendants		–	–	–	X	X	–	X
Amber spacer plates		X	X	–	–	–	X	–
Faience beads		X	–	–	–	–	X	–
Amber: Pendants and discs		X	–	X	–	X	–	–
: Beads or buttons		X	X	–	X	–	X	X
Shale or lignite beads		–	–	X	X	–	X	–
Gold-plated ingot-torc pendant		–	–	–	–	X	–	–

NOTES

(*a*) Less than 8 inches high, i.e. beaker/corded ware size.
(*b*) The large urn from Upton is lost. (*c*) (?) Related to Aldbourne cups.

List of Graves

A. WILSFORD G.54 (Lake, 21), Colt-Hoare, *op. cit.*, p. 212, Pl. XXXI; cf. *WAM.*, xxviii, p. 261; xxxv, p. 586. *Arch.*, xliii, p. 505.
B. UPTON LOVELL GOLD BARROW G.2*c*, Colt-Hoare, p. 99, Pl. XI.
C. WILSFORD G.7 (Normanton, 156), *ibid.*, p. 202.
D. PRESHUTE G.1*a* (Manton, 68), *Gentleman's Magazine.*
E. WILSFORD G.8 (Normanton, 155), Colt-Hoare, p. 201. Pl. XXV.
F. AMESBURY G.44, Stukeley, *Stonehenge*, p. 44.
G. HENGISTBURY HEAD, Barrow I, Bushe-Fox, "Excavations at Hengistbury Head, 1911–12," *Research Report of the Society of Antiquaries of London*, III.

Appendix A

List of daggers of "Bush Barrow" type from Wessex period graves.

Locality	Dimensions Length : Breadth (Inches)	Rivets	Rite	Notes and References
England				
Dorset				
(1) Boveridge Ho., Cranbourne	12·75:	4 or 6	?	Thickened centre. With K/D 4·25 inches.* *Dorchester Mus.*
(2) Ridgeway Barrow 7 (Secondary No. 3)	(*a*) 6·0 : 2·5	6	Cr.	Flat, languette, 2 lines on blade
	(*b*) 6·00: 2·4	6		Flat, three lines on blade. Also small bronze K/D, slightly flanged axe, and gold dagger pommel. *Dorset N. H. and A. S.*, 58 (1936) 20
(3) Barrow 10 Winterbourne Came	9·25: 2·2	6	(?)In.	Cast slightly ogival. Three lines on blade. With ogival dagger 7·0–7·25 ins., 3R, Pointillé midrib, three lines. *Dorchester Mus. C.T.*, I, 35
Norfolk				
(4) Cressingham	9·0: 2·4	6	In.	Two broad grooves, two lines. With bronze K/D, amber beads, flat gold plate and (?) bracelet and ring. *Norwich Castle Mus. Arch.*, xliii, p. 454
Wiltshire				
(5) Barrow G.85 Amesbury	6·8 : 2·3	6	Cr.	Midrib, three lines. With bronze K/D (4·5 ins.) whetstones and antler implements. Secondary to Early Bronze Age "A." Inhumation with a flat dagger. *Salisbury Mus. W.A.M.*, xlv, p. 432
(6) Idmiston	5·5 : 2·6	6	?	Thickened midrib, four lines. "From a barrow." *Salisbury Mus.* Evans, Fig. 296
(7) Barrow G.23 Wilsford (Normanton 139)	7·8 : 2·75	6	Cr.	Pointillé decorated midrib three lines. With K/D 4·2 ins., bronze crutch headed pin with plain stem and perforated head, perforated whetstone and bone tube. Hoare, *A.W.*, 199
(8) Barrow G.5 Wilsford	(*a*) 10·6: 3·15	6	In.	Flat, wooden handle studded with gold pins, languette.
"Bush Barrow," Normanton 158	(*b*) 13·0: 3·0	6		Midrib, wooden sheath. With flat bronze axe, two gold plates and gold scabbard hook, oolite mace or sceptre and bone mounts, and (?) a wooden shield. Bronze K/D. *Devizes Mus. A.W.*, 203

* K/D, abbreviation for Knife-Dagger.

Appendix A—continued

Locality	Dimensions Length : Breadth (Inches)	Rivets	Rite	Notes and References
Wiltshire—continued				
(9) Barrow G.43 Wilsford Lake Barrow 8 "*Prophet Barrows*"	6·75: 2·1–2·3	6	Cr.	Bold narrow midrib, cast slightly ogival, 3 lines; with perforated whetstone. *Devizes Mus. A.W.*, 210, 211
(10) Winterbourne Stoke G.5 (H.16)	(*a*) 8·5–9·0 : 2·5	6	In.	Flat, languette, 2 lines
	(*b*) 8·5 : 2·0	6		Flat, 3 lines. With bronze awl with bone handle, and fragments of a five-handled jar. In a wooden coffin. *Devizes Mus. A.W.*, 123
Yorkshire				
(11) Brough	7·0 : 2·7	6	In.	Midrib, three lines. With bone quatrefoil-headed pin. *B.M.* (Dagger). *P.P.S.*, Vol. xv (1949), p. 100 (pin).
(12) Hutton Buscel	(?) 8·0 : (?)2·8	(?)6	(?)In.	Midrib, two lines. With planoconvex flint knife. (?) Secondary to Food Vessel. Greenwell, *British Barrows*, clii, p. 359, Fig. 144
(13) Towthorpe Barrow 233	6·2 : 2·2	6	In.	Midrib, three lines, languette. Stratigraphically earlier than Food Vessel. Mortimer, p. 7
(14) Towthorpe 139	6·8 : 2·0	6(?)	In.	Thickened centre, three lines, bronze sheath. With extended male inhumation, stone hammer head or sceptre, and planoconvex knife. Mortimer, p. 5

Appendix B

List of daggers derived from or related to Wessex six-riveted daggers.

Locality	Dimensions Length : Breadth (Inches)	Rivets	Rite	Notes and References
England				
Derbyshire				
(1) Dow Low, Sterndale	5·0 : 2·0	3	In.	Flat, three lines. Bateman, *Vestiges*, p. 96
Kent				
(2) Aylesford	(*a*) 6·8 : 2·4	4	In.	Three lines, mid-rib
	(*b*) 5·1 : 2·05	4		Flat knife dagger. With a flat axe; (?) a flat grave. *Proc. Soc. Ant.*, xvii (1899), p. 373
Scotland				
(3) Blackwaterfoot, Arran	9·0 : 2·6	4	(?)In	Three ribs on blade, gold pommel. *P.S.A.S.*, xxxvi, p. 118
(4) Wester Mains of Auchterhouse, Angus	9·5 : 2·5 (includes hilt)	6 plus 3	Cr.	Triple-reeded midrib, horn hilt, ivory "pin," cf. Bush Barrow pins. *P.S.A.S.*, xxxii, pp. 205–20.
(5) Collessie, Fife	6·0 : 2·2	3	Cr.	Flat; gold pommel binding. Contemporary with two C beakers. Anderson, *Scotland in Pagan Times* (*Bronze and Stone Ages*), pp. 5–10
(6) Skateraw, Dunbar	5·8 : 2·2	4	In.	Flat; gold-bound pommel. *P.S.A.S.*, xxvii, p. 7
Ireland				
(7) Topped Mountain Cairn, Co. Fermanagh	5·6 : 2·0	4 or 6	In.	Two lines, thickened centre, gold pommel binding. With a Type E Irish Food Vessel; a cremation in the same cist. *P.R.I.A.*, Ser. III, Vol. iv, pp. 651–6
(8) Croghan Erin, Co. Westmeath	18·0 : 3·0	?	In.	Dagger or short sword (lost); *figured* or *carved* round the edges, blade *thin* (i.e. no mid-rib). Fragmentary Food Vessel. *P.R.I.A.* (Ser. I), iv, p. 388
Wales				
(9) Llanddyfan, Anglesea	4·0 : 1·5	3	Cr.	A knife/dagger, with two grooves and pointillé decoration. Found with a flat axe, another very elongated flat axe, enlarged Food Vessel, and Food Vessel related to corded Beakers. (Not included in the table of associations.) *Arch. Camb.*, 1909, p. 321
England				
Dorset				
(10) Ridgeway, Barrow 7 Upwey Down Secondary No. 1	7·25 : 2·0	3	In.	Midrib; cf. Normanton 139, languette, no lines, not ogival. K/D near by; small bone dagger-pommel, stone mace-head, flint axe. See Appendix A (2). (Not included in table of associations)

Appendix C

List of bronze daggers of ogival type from graves in the British Isles.

Locality	Dimensions Length : Breadth (Inches)	Rivets	Rite	Notes and References
England				
Cambridge				
(1) Chippenham Barrow I	6·6 : 2·8	3	In. (f)	Midrib, three lines. Double axe/hammer Gp. 12. *Camb. Ant. Soc.*, xxxi, p. 134. *Ant. J.*, xv, p. 61
Cornwall				
(2) Angrowse Mullion I	6·75:	3	Cr.	Two grooves. Handled Cornish urn. *Arch. J.*, ci, p. 32
(3) Pelynt	: 2·6–2·8	2 (?3)	Cr.	Thickened midrib, like Rillaton. Hencken, 1932, p. 73
(4) Rillaton	10·0 : 2·8	3	In.	Pointillé, thickened midrib. Gold cup, urns and ornamental earthenware (incense cup?), "ivory," glass or faience beads. *Arch. J.*, xxiv, p. 189
Berkshire				
(5) Ashdown Park	6·75:	4	—	Two grooves, thickened centre. *Newall's List*, No. 3
(6) Rowcroft, Yattendon	7·5 :	2	Cr.	Barrow 36 ft. diameter. *Newall's List*, No. 1
(7) Stanmore Farm, Beedon	7·2 : 2·2	2 (?3)	Cr.	Rounded midrib, five lines. Incised incense cup. Bell Barrow, central pyre. Peake, *Arch. of Berks.*, p. 51. *Newall's List*, No. 2
Devon				
(8) Great Torrington	9·25 : 2·25	3	Cr.	Midrib, two lateral grooves leaving a raised rib, wooden sheath. Hilt with two rivets. *Trans. Devon Assoc.*, vii, p. 102
Dorset				
(9) Winterbourne Came Barrow 10	7–7·5 : 2·8	(?)3	(?)In.	Pointillé decorated midrib three lines (damaged), wooden sheath. (?) With inhumations and a six-riveted dagger six feet below surface of an immense barrow. See Appendix A. Warne, *C.T.*, I, 35, Dorchester
(10) Martinstown	8·0 : 2–2·2	3	Cr.	Thickened midrib, two grooves, with plain incense cup. Secondary to inhumation with handled bowl. *Dorch. Arch. F.C.*, xxvi, p. 14. *B.A.P.*, II, 28
(11) Barrow near Maiden Castle	5·5 : 2·1	3	Cr.	Pointillé decorated, two lines, with K/D 4 ins. Warne, *C.T.*, "Various Periods," No. 73, p. 46. *Arch.* xxx

Appendix C—continued

Locality	Dimensions Length : Breadth (Inches)	Rivets	Rite	Notes and References
Dorset—continued				
(12) Winterbourne St. Martin	9·0 : 2·6	3	?	Pointillé decorated centre four lines. Ploughed out of a barrow. *Dorchester Museum*
(13) Dewlish Barrow 38	6·2 : 2·0	2	Cr.	Pointillé decorated. Thickened centre four lines. *Dorchester Museum, C.T.*, II, 51
(14) Lord's Down, Dewlish Barrow No. 5	6·2 : 2·3	3	Cr.	Thickened centre, pointillé. Whetstone, bone pin, bone tweezers. Central grave. *Dorchester Museum.* Warne, *C.T.*, II, 50
(15) Fordington	6·15: 2·5	3	?	Thickened centre of blade, grooves, pointillé decorated. Found with bone implements. *Arch J.*, v (1848), 322. *Dorchester Museum*
(16) Fordington, Lawrence Barrow	8·75:		Cr.	Thickened centre of blade. With a K/D. *Dorchester Museum, P.* 11; *N.* 10
Gloucester				
(17) Snowshill	8·4 : 2·5	3	In.	Midrib, four lines, with tanged-and-ferruled spearhead. Double axehammer. Crutch-headed bronze pin. *Arch.*, lii, pp. 70–2
Somerset				
(18) Camerton Wall-mead Barrow	6·15: 1·95	2	Cr.	Midrib four lines. With Aldbourne cup, whetstone bronze bulb-headed pin. *Arch.*, xliii, p. 169, Bristol
(19) Sigwell, Gristhorpe Barrow	6·0 :	3	Cr.	Elm bark coffin with cover. *Somerset Arch. Soc.*, xxiv (ii), pp. 75–83
(20) West Cranmore	7·15: 2·25	3	Cr.	Midrib. With K/D and flint implements. *S.A.S.* 85, p. 163; *Arch.*, xliii, pp. 289, 453. *Mus. Soc. Ant. Lond.*
Sussex				
(21) Hove	6·0 : 2·3	3	In.	Midrib, two lines. Double axe-hammer, perforated whetstone, handled amber cup. Tree coffin in barrow. Curwen, *Archaeology of Sussex*, p. 162
Wiltshire				
(22) Ablington G(?) 25 (Figheldean)	7·55: 2·5	3	Cr.	Cf. Hoare, A. W., Pls. xiv, xv, xxiii. With flat K/D 3 ins., boar's tusk, deer horn. *W.A.M.*, 36, p. 625
(23) Edington, Row Barrow (South Down Farm) G.2	7·5 : 2·2	3	Cr.	Midrib, five lines, pointillé decorated midrib. (?) Two small flat daggers. Hoare, *A.W.*, 67

Locality	Dimensions Length : Breadth (inches)	Rivets	Rite	Notes and References
Wiltshire—continued				
(24) Collingbourne Ducis G.4 (Everly H.24)	5·25: 2·2	3 only 2 left	Cr.	Midrib, two lines. With double chain-headed pin and incense cup in wooden coffin. *A.W.*, 184. *Arch.*, xliii, 452
(25) Winterbourne Stoke H.15 (G.4)	8·5 : 2·7	3	Cr.	Pounced midrib, four lines. With K/D, 3 ins., bone tweezers, bone bow tips, and pin in bronze bound elm chest. Hoare, *A.W.*, 122, Pl. xiv
(26) Wilsford G.27 (Normanton H.177)	7·0 : 2·5	3	Cr.	Pointillé decorated midrib, three lines. With K/D 3·5 ins. Hoare, *A.W.*, 207
(27) Wilsford G.56 (Normanton H. 182)	8·75: 2·6	3 large, plus 1 small	Cr.	Rounded midrib, five lines. Sheath of wood and cloth, with bone tweezers and pin and K/D 3·5 ins. in wooden box (unbarked trunk). Hoare, *A.W.*, 207
(28) Upton Lovel Barrow 5 (?G.2)	6–6·5 : 2·0	3	Cr.	Three parallel lines. Possibly contemporary with urn-cremation nearby. Hoare, *A.W.*, 76
(29) Amesbury G.24 (Vespasian's Camp)	8·4 : 2·5	2	Cr.	Three lines, with ring-headed bronze pin (lost), crutch-headed. *W.A.M.*, xliii, 350
(30) Bulford	5·4 :	3	(?)In.	Two grooves, said to have been found with a "drinking cup" (lost), Ashmolean (dagger). *W.A.M.*, xxxviii, 217. Not included in the table. The "drinking cup" is the result of confusion with Winterslow Bell Barrow, *W.A.M.*, xlvii, 174–82
(31) "South Wilts 1855"	5·1 : 2·0	(?)3	?	Four lines, with bronze awl and bone pins. *B.M.*
(32) Amesbury	9·25: 2·4	3	?	Three lines. *Salisbury Mus.*, *W.A.M.*, xlii, p. 601
Yorkshire				
(33) Loose Howe (N. Riding)	(?)8·0 : (?)3·2	3	Cr.	Five lines, thickened centre, with plain cinerary urn, corded pigmy cup, stone battleaxe, bronze trefoil-headed pin. *P.P.S.*, xv, p. 87
Middlesex				
(34) Teddington	7·0 : 2·1	(?)3	Cr.	Triple-beaded midrib, with "flint chippings." From a barrow. *Arch. J.*, xiii, p. 305. *Arch.*, xliii, p. 453, Pl. xxxv, Fig. 2
Hampshire				
(35) Ibsworth, Hannington	5·5 : 2·1	2	Cr.	Two grooves, thickened centre with pointillé, with bone pin. *P.S.A.* (2nd Series), xxiii, 98
Oxford				
(36) Stanton Harcourt	6·5 : 2·25	3	Cr.	Dagger with midrib and three cast grooves; bronze sharpening tool, perforated whetstone, bone pin, flint fabricator, jet and amber beads, slashed-and-incised pigmy cup. Ditched round barrow. Cremation *in situ* with supported pyre. *Oxoniensia*, x, 16, and Fig. 9

ADDENDA
ATYPICAL DAGGERS OR DEGENERATE DAGGERS RELATED TO THE PRECEDING CLASS BUT NOT INCLUDED

Locality	Dimensions Length: Breadth (Inches)	Rivets	Rite	Notes and References
Cornwall				
(37) Harlyn Bay Barrow III	6·5 : 2·0	2	Cr.	Not an ogival dagger. With handled Cornish urn, incense cup, hone and (?) spindle whorl (!). *Ant. J.*i., 290
Dorset				
(38) Clandon	?	(?)3	Cr.	Fragmentary dagger, possibly ogival. With cinerary urn, incense cup, amber cup, mace head (or sceptre), flat gold plate. *Dorchester Museum. D.N.H.A.S.*, 58 (1936), p. 18
(39) Ridgeway (barrow on)	6·0 :	3	(?)Cr.	Very degenerate midrib dagger. *Dorchester Museum*
(40) Roke Down, Bere Regis	13·0 :	5	Cr.	With ivory hilt, midrib, 4 lines, akin to bronze-hilted West European daggers. With (?) two small bronze K/D. Warne, *Celtic Tumuli*, II, p. 16.
Wiltshire				
(41) Lake, Wilsford	3·4 :	3	?	Four lines, rounded midrib. A minature ogival dagger. *Arch.*, xliii (ii), Pl. xxxiv, Fig. 4
Devon				
(42) Hameldon Down	Dagger, fragmentary	?	Cr.	Gold and amber pommel
Scotland				
(43) Hyndshaw Carluke, Lanark	6·75: 2·25	3	In.	Midrib with circular section. (?) Hiberno-Scottish type. *P.S.A.S.*, xii, p. 455. *P.S.A.S.*, vii, pp. 440–1

Appendix D

Hybrids between the Bush Barrow and ogival types of dagger.

Locality	Dimensions Length: Breadth (Inches)	Rivets	Rite	Notes and References
Dorset				
(1) Woodyates Barrow 20 (Oakley Down)	5·0 : 2·0	4	Cr.	Pointillé decorated thickened centre, three lines. Rivets are of thin Bush Barrow type. With cinerary urn, bone point and bone needle. (Wooden hilt.) Hoare, *A.W.*, 242
Wiltshire				
(2) Amesbury G.15 (Normanton Barrow 164)	5·75: 1·75	3	In.	Stout centre, three straight lines, dagger cast slightly ogival in outline, rivets as above. With small "dagger" and "drinking cup" (both lost). Inhumation on elm plank. *A.W.*, 265

Appendix E

References to hoards found in the British Isles mentioned in the text.

(1)	Arreton Down, Isle of Wight	Franks, A. W. *Arch.*, xxxvi (1855), p. 326 Piggott, S. *Ant. J.*, xxvii (1947), p. 177
(2)	Buckland, Dover, Kent	Megaw and Hardy, *P.P.S.*, iv, p. 283
(3)	Gavel Moss Farm, Lochwinnoch, Renfrew	Callander, G. *P.S.A.S.*, lvii, pp. 127–30 Scott, J. G. *P.S.A.S.*, lxxxv, pp. 134–8
(4)	Ebnal, Shropshire	Chitty, L. F. *Arch. Camb.*, 95 (1940), p. 36
(5)	Moons Hill, Isle of Wight	Sherwin, G. F. *Ant. J.*, xxii, p. 198
(6)	Stoke Abbott, Dorset	Newall, F. (in) *W.A.M.*, xlv, p. 455. Dorchester Museum
(7)	Plymstock, Devon	*Arch. J.*, xxxvi, p. 349, Evans, *Bronze*, p. 464
(8)	Westbury-on-Trym, Gloucestershire	Megaw and Hardy. *Op. cit.* (Also Piggott in *P.P.S.*, iv, p. 83)
(9)	Killaha, Co. Kerry	S. P. Ó Ríordáin. *P.P.S.*, 1945–6, p. 158, Pl. xii

ABBREVIATIONS

A.W. (*Hoare*). Hoare, R. C., *Ancient Wiltshire* (2 Vols).
C.T. (*Warne*). Warne, C., *The Celtic Tumuli of Dorset.*
Mortimer. Mortimer, J. R. *Forty Years' Researches in the British and Saxon Burial Mounds of East Yorkshire.*
Bateman Vestiges. Bateman, J., *Vestiges of the Antiquities of Derbyshire* (1866).
Hencken 1932. Hencken, H. O'N., *Archaeology of Cornwall* (1932).
Holste, *N.M.H.*, Holste, Fr., *Die Bronzezeit in Nordmainischen Hessen* (*Vorgesch. Forschungen*, 12), 1939.
Newall's List. Newall, F., "Barrow 85, Amesbury," *W.A.M.*, xlv.
Others as in Childe, *Dawn.*

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